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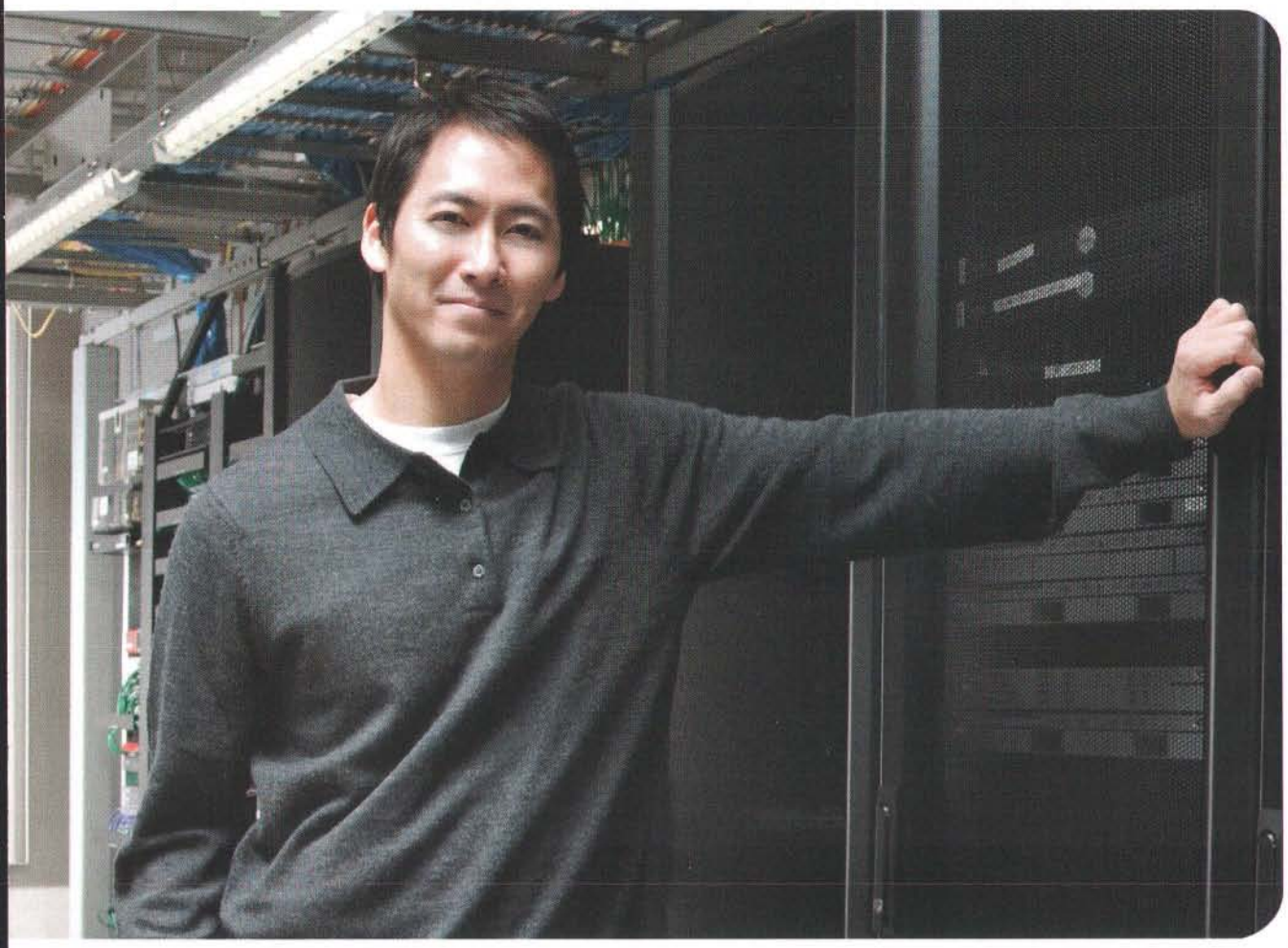

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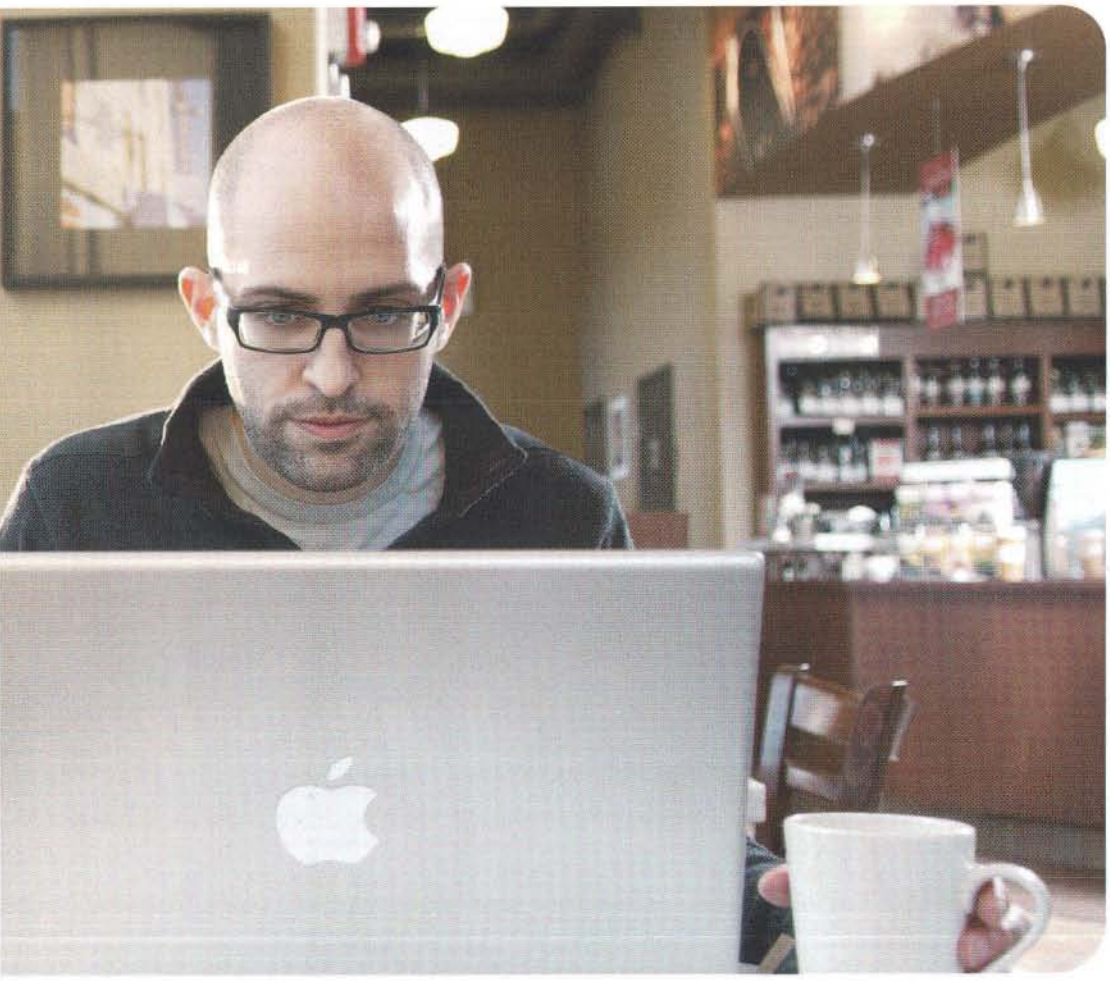

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When and Where?

MacTech Conference for IT Pros and Apple developers is November 3-5, 2010, in Los Angeles at the Sheraton Universal in Universal City. The three-day, packed event will have sessions and activities throughout the day and evening giving attendees the opportunity to not only learn from the best, but to also get to know others in the industry.

Two Session Tracks.

The MacTech Conference will have two separate tracks: one focused on IT, and one focused on programming/development. Sessions will focus on both desktop and mobile, with appropriate levels of attention paid to the Mac, iPhone, iPad and iPod.

Packed Schedule. Morning 'til Night.

You won't just be in sessions hearing about great technologies and products. MacTech Conference has a packed evening schedule designed not only to be fun, but also to give you the opportunities to get to know your fellow attendees. This includes an exclusive trip to the world renowned Griffith Observatory, and a party at Jillian's that includes the new MacTech Bowl.

All Meals Included.

This is an immersive conference, and as such, the time you spend with peers you know and new people that you meet is as important as the sessions themselves. We'll be feeding you throughout the event not only to make it all inclusive, but also so that you can maximize your time with other attendees.

Space is Limited.

We have a limited number of conference attendee spots and hotel rooms available. As a conference with hundreds, not thousands, of people, we want you to have time to get to know people. But, that also means that (like other conferences in the Apple market) if you don't act fast, you may miss out.

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TABLE OF CONTENTS

Mac in the Shell
Window Management for Keyboard Junkies
Or, making the GUI act like the command line
by Edward Marczak 8

Sharkfest 2010
The Annual Wireshark Network and Packet Analysis Conference
by Kok-Yong Tan 20

Scripting with SatImage, Part 2
by José R.C. Cruz 28

MacEnterprise
A Second Date with AAMEE
Revisiting Adobe Application Manager, Enterprise Edition
by Greg Neagle 46

Your Own Software Consultancy Business: Starting Thoughts
Things to think about before going out on your own
by Ryan Wilcox 50

Developer to Developer
What's Your Style?
A look at coding style and formatting in Objective-C
by Boisy G. Pitre 60

Installing Joomla! on a Mac
By Mihalis Tsoukalos 64

CoreSec: Security topics for administrators and programmers
It's Not Your Kid's Cell Phone Any More
iOS 4 is changing the portable device game with serious enterprise features.
By Michele (Mike) Hjörleifsson 70

Kool Tools
Checkout • MailPlane
Hansaworld Enterprise • TrueShip ReadyShipper
by Dennis Sellers 76

The MacTech Spotlight
Philippe Casgrain
TransGaming, Inc. 80

From the Editor

Something that I've been a bit consumed with lately is analyzing why we do what we do. Specifically, why do any of us get involved with computers and the jobs associated with technology. It's a question I've been asking myself and just about every self-avowed technology professional that I meet. I personally was intrigued by video games - specifically, an Atari 2600 - that made me wonder how it all worked. On getting my own Atari console, I took it apart in short order. I learned how to repair the joysticks and solder the many connections. This all ultimately led to development and system integration.

Perhaps I'm not the youngest tech in the room any longer, but that curiosity remains. How does this work? How far can I push this? I'm finding that the best techs at any age still have that curiosity and are just intrigued by technology itself, without respect to hardware or OS. There are plenty of necessary ancillary roles in the technology field that don't necessarily require hardcore coding skills or knowledge of every facet of an operating system.

I'd posit, though, that in every profession, curiosity is what keeps the passion alive. So, what are you curious about? Are you forever exploring? Or are you stuck in a rut? If you're stuck a rut, consider a change: if you're a database person, go learn about CoreAnimation. If you haven't ventured into iOS apps, perhaps now is the time. If you're not ready for other diversions, look at improving and perfecting the work you're already doing. There's just too much out there to ever get bored.

This month, we're really trying to ensure you're not developing tech ennui. Our cover story signals a new series of articles from Ryan Wilcox, "Consultant Cowboy." Consultants face a unique challenge: keeping up with all of the technology while taking on business leadership. Ryan writes of his own experiences to help guide those just getting started in the consulting arena.

Sharkfest is an annual conference for people using the Wireshark Network Packet Analyzer. Reading network packet traces is yet another language and takes a particular skill to read and decode. Returning author Kok-Yong Tan attended this year's conference and delivers a write up introducing the show and reviews the activities for those interested in learning more.

Speaking of digging below the surface, Greg Neagle always seems to be digging in further than most and this month reveals a bit more in his exploration of Adobe's newest utility, AAMEE. IF you're a Mac System Administrator, This month's MacEnterprise column shows you what AAMEE can (and connot) do for you.

Boisy G. Pitre's new column, "Developer to Developer," exemplifies a way to refine something you're already doing: writing code. "What's Your Style?" should have you questioning your coding style and making sure you have reasons behind your choices.

José Cruz's "Scripting with Satimage" continues with a second part that extends the basics introduced last month.

Mike Hjörleifsson writes in this month's CoreSec about ways to manage iOS devices. As more and more iPhones and iPads are rolled out as Enterprise devices (and, by extension, corporate owned), more and more scrutiny will be placed on keeping these mini-computers in check. If you're now facing this, this is the article for you.

Returning author Mihalis Tsoukalos brings up a topic that we're often asked about: getting a web-based CMS running on Mac OS X. This month, he delves into the installation of Joomla!, a popular CMS with an active development community.

This month's Mac in the Shell talks about several window management tools from independent developers that help you avoid using the mouse and help you get your windows just so.

Finally, this month's MacTech Spotlight shines on Philippe Casgrain, a developer at TransGaming, Inc. We've probably all played a Cider-based game on the Mac by now, and we'd all have to admit that it's pretty cool technology. To work on this technology, Philippe had to stretch the bounds of his love for OS Xand Cocoa to learn a bit about the Windows API. Check out Philippe's story in this month's Spotlight.

Until next month, keep questioning yourself, improving on yourself and stay curious.

Ed Marczak,
Executive Editor

Communicate With Us

Department E-Mails

Orders, Circulation, & Customer Service
cust_service@mactech.com

Press Releases
press_releases@mactech.com

Ad Sales
adsales@mactech.com

Editorial
editorial@mactech.com
(Authors only, no pr)

Accounting
accounting@mactech.com

Marketing
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Regular Contributors

José R.C. Cruz, Michael Göbel, Michele Hjörleifsson, Mihalis Tsoukalos
Oliver Pospisil, Rich Morin, William Smith

Canada Post: Publications Mail Agreement #41513541
Canada Returns to be sent to: Bleuchip International, P.O. Box 25542, London, ON N6C 6B2

MacTech Magazine (ISSN: 1067-8360 / USPS: 010-227) is published monthly by Xplain Corporation, 705 Lakefield Road, Suite I, Westlake Village, CA 91361. Voice: 805/494-9797, FAX: 805/494-9798. Domestic subscription rates are $47.00 per year. Canadian subscriptions are $59.00 per year. All other international subscriptions are $97.00 per year. Please remit in U.S. funds only. Periodical postage is paid at Thousand Oaks, CA and at additional mailing office.

POSTMASTER: Send address changes to **MacTech Magazine**, P.O. Box 5200, Westlake Village, CA 91359-5200.

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by Edward Marczak

Window Management for Keyboard Junkies

Or, making the GUI act like the command line.

Welcome

When one uses the command line often—when one becomes immersed—it gets uncomfortable to take your hands from the keyboard to go move the mouse pointer; At least for extended operations. This is why you can assign keyboard shortcuts to most menu items (see the Keyboard Preference Pane). It turns out that most of us don't want to simply use our shiny Macs as dumb terminals. If *all* you needed was a shell prompt, you could go buy a netbook and use Linux (which is perfectly appropriate in many cases). So, how can you go mouse-free in the GUI (or, at least minimize using the mouse)? Read on to find some ways.

Why?

Why on Earth would one want to eschew the mouse; the very device that made the Macintosh popular? It all comes down to speed—once learned, it's faster to navigate via the keyboard than the mouse. You likely first realized this when you learned about cut and paste: command-C and command-V are faster by orders of magnitude than using the mouse to mouse to the menubar, click on Edit, scroll to Cut, release, choose the new location, mouse to the menubar…you get the idea.

My search for a window manager came down to a few solid reasons:

I began using my 13" MacBook Pro on and off with larger monitors (a 24", a 30" and a projector). I wanted to quickly take advantage of the real estate on the larger monitors, but keep sanity on the 13" screen.

I wanted to automate the process of moving windows as much as possible.

I have tech-OCD and want my windows in some very specific ordering and to be neatly tiled and non-overlapping (in general)…and not get messed up (without an easy way to restore).

There's no functionality built-in to Mac OS X to handle these chores. All window managers that deal with this are from third-party (usually indie) developers. They're all more than affordable, so, go support Mac devs!

Stay

Stay (http://cordlessdog.com/stay/) is from Australian-based Cordless Dog Software. It's pretty much the simplest utility of the bunch. Get your windows just where you want them and then have Stay remember the Window positions. That's it.

Figure 1-Stay menubar menu.

You can manually have Stay restore saved window positions at any time. Better yet: Stay remembers window positions per monitor and will automatically restore window positions upon connecting or disconnecting monitors.

Stay is a simple application that says what it does, and does what it says with no fuss. Its simplicity betrays itself a little for power users, though. First, windows are gathered by window title and if those titles change, windows won't be restored. For example, if Safari has the Apple home page open when I store the window, that window title is "Apple." Now I load up a new page, giving that window a new title (or just a different tab is selected) and I plug in a new monitor. The Safari

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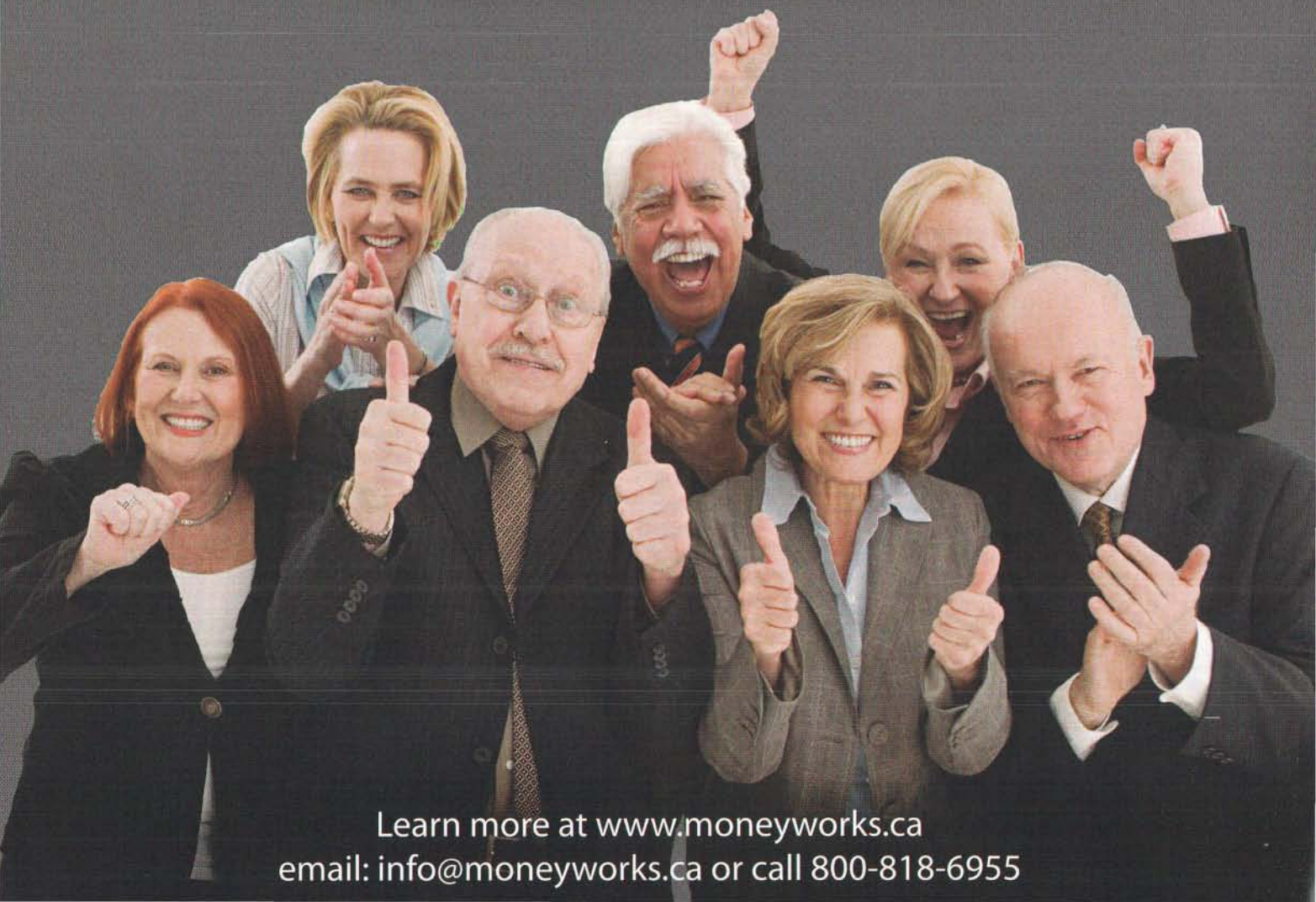

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window isn't recognized because its title doesn't match one that is stored. This is certainly a non-trivial problem to address, but don't let it bite you.

Second, Stay currently doesn't have a method to restore the positions of a single window, or windows of a particular application. This means that if I have a set of Windows just where I want that differs from my Stay saved config, but one application is not quite where I want the window, restoring the Stay config is actually *more* work for me.

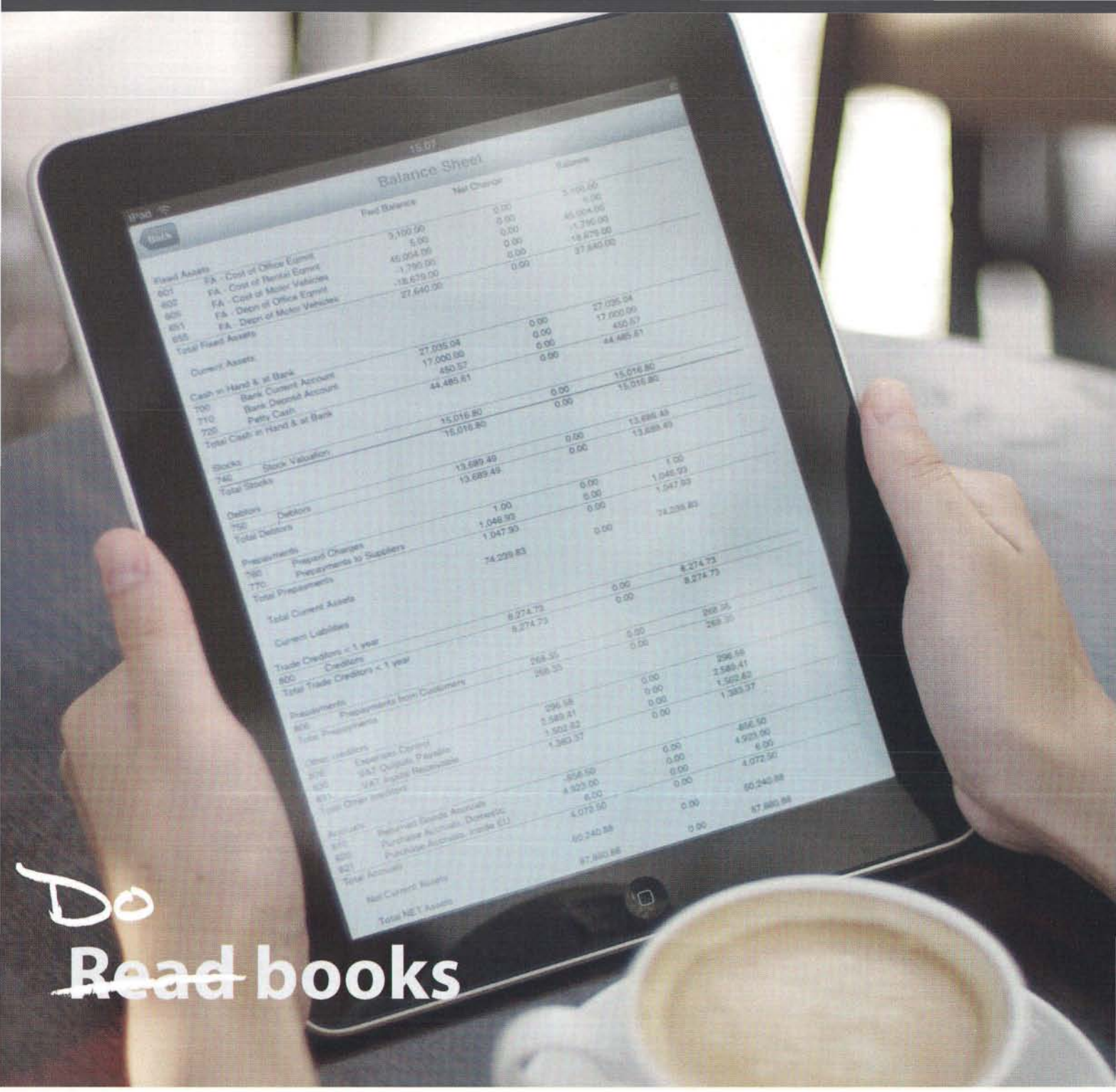
Stay's utility is in its uncluttered nature and that it does one simple thing properly. It has the ability to assign a keyboard shortcut to restoring all windows, which keeps your hand off of the mouse. I keep Stay running all of the time and it does the Right Thing (according to what I want) nearly all of the time. Stay's use in conjunction with some of the other utilities in this article makes it a keeper for me.

Stay is in active development and version 1.1 was released as I was writing this article. Version 1.1 brings the ability to restore windows across Spaces, which is a welcome update.

Breeze

Breeze (http://www.autumnapps.com/breeze/) from Autumn Apps is a bit of a different window manager. It saves the relative size and position of a window—relative to the monitor, that is—and then allows you to apply that state as a template to another focused window. Let's say I like my browser window to take up the full height of a screen, but only about two-thirds of the width. While on my 13" screen, I could save a Safari window with just the right position and dimensions. First, I could then load Firefox and apply the window template to a default Firefox window, setting my browsing window just the way I like it. Secondly, if I plug into a new, larger monitor, I could then apply that same template to a window there, and it will still take up the entire height of the screen and about two-thirds of the width. Brilliant!

Figure 2-Breeze menu with keyboard shortcuts for window templates.



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Like all utilities that really make life better, Breeze allows you to assign keyboard shortcuts to all templates, reducing the time needed to mouse around. Breeze also has a nice "Rescue Window" function for those times when switching monitor resolutions leaves a window stranded (although, I'll admit that I can't remember a time when this has happened to me under Mac OS X 10.6).

Breeze fills a very particular niche, and like Stay, perfectly performs the duties that it claims to handle.

Divvy

As I mentioned, I have a bit of tech-OCD: I really, really like my windows positioned *just so*. Divvy (http://www.mizage.com/divvy/) appeals to me in ways that other window managers never have on any platform (I always use a tiling window manager in Unix). Although the previous two utilities I mentioned can *store* the state of windows (or a template thereof), *getting* the window to that state in the first place can be trying. Enter Divvy.

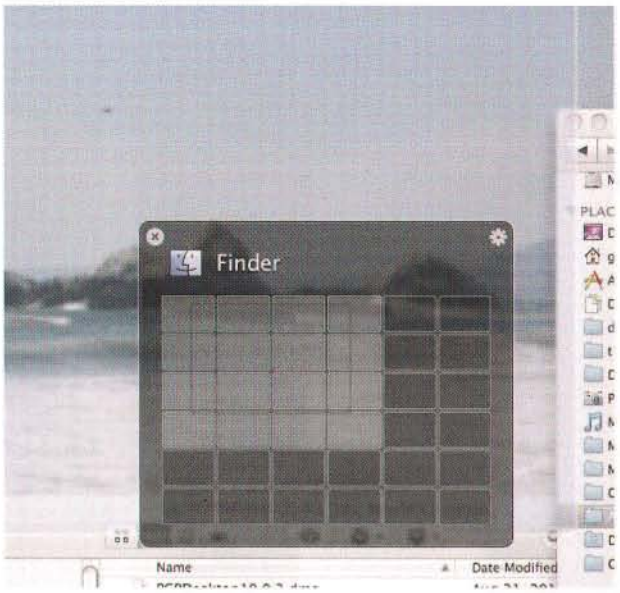

Figure 3-The Divvy panel with a portion of the workspace selected.

Figure 3 shows the Divvy interface in action. The HUD window is clear to see: Divvy neatly partitions your workspace into equally aligned subdivisions. You can tap the option key to double the grid (halving the size of the divisions), or, configure the default grid to your liking.

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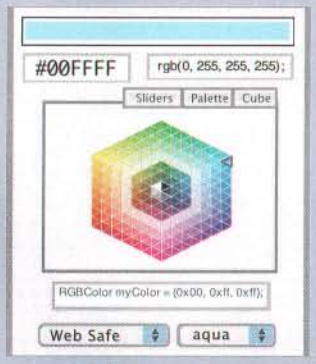

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What may not be so easy to see in the screen capture of Figure 3 is that as you're dragging on the small grid, Divvy is also drawing a transparent window to show where the real, currently focused window will actually be placed. When you release the mouse, the currently focused window will snap to the area defined.

I probably don't have to mention it, but Divvy also supports keyboard hot key shortcuts. Figure 4 shows how you can set up window templates with hot keys.

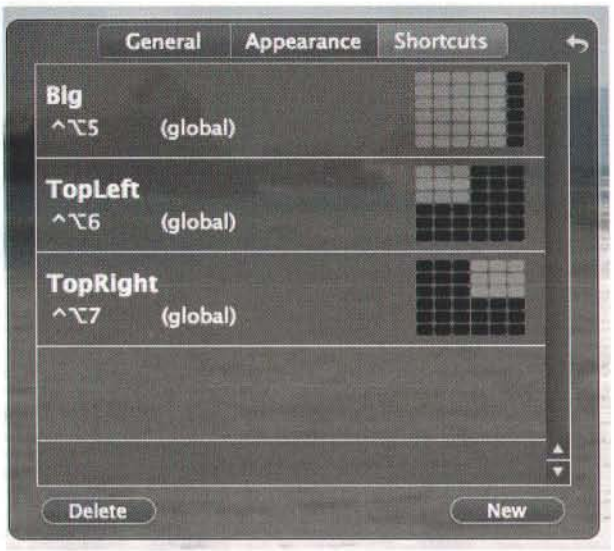

Figure 4-Divvy custom hot key definitions.

These shortcuts work properly across monitors of different sizes and resolutions.

I tend to dislike most snap-to-edge window managers, but Divvy deftly overcomes that. It's a utility that I always have running.

Cinch and SizeUp

I mention these two utilities together as they come from the same developer, Irradiated Software, and compliment each other very well. Both utilities are simple and straightforward.

Cinch (http://irradiatedsoftware.com/cinch/) is simple enough that I can only give a short description. With Cinch running, click-hold and drag a window to one of three edges of your workspace. Dragging the window to the top edge will make the window resize full-screen. Dragging to the left or right edge will resize the window to full height and half-screen width, to the respective side you've dragged to. That's it! Cinch makes it painless to grab two windows and create a split-screen arrangement for easy comparison. The bonus to all of this is that when you drag a window away from the maximized position, it snaps back to its original size. This is very similar to a feature in Windows 7—if you're a multi-platform person and like it there, you'll like it on Mac OS X.

As great as Cinch is, it's entirely mouse driven (and by now, you know how I feel about that). SizeUp (http://irradiatedsoftware.com/sizeup/), is like Cinch's

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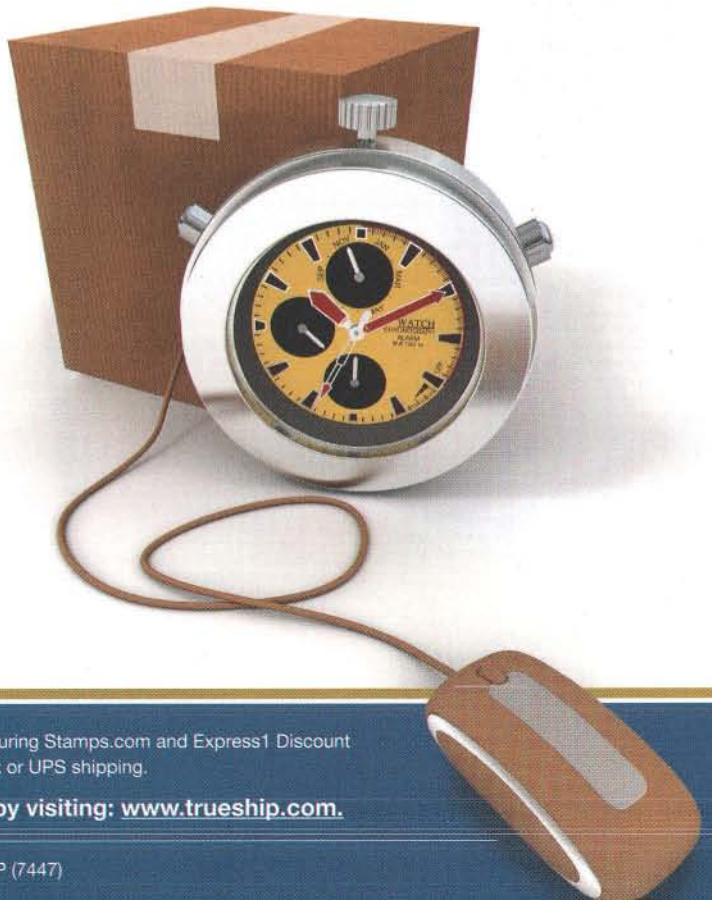

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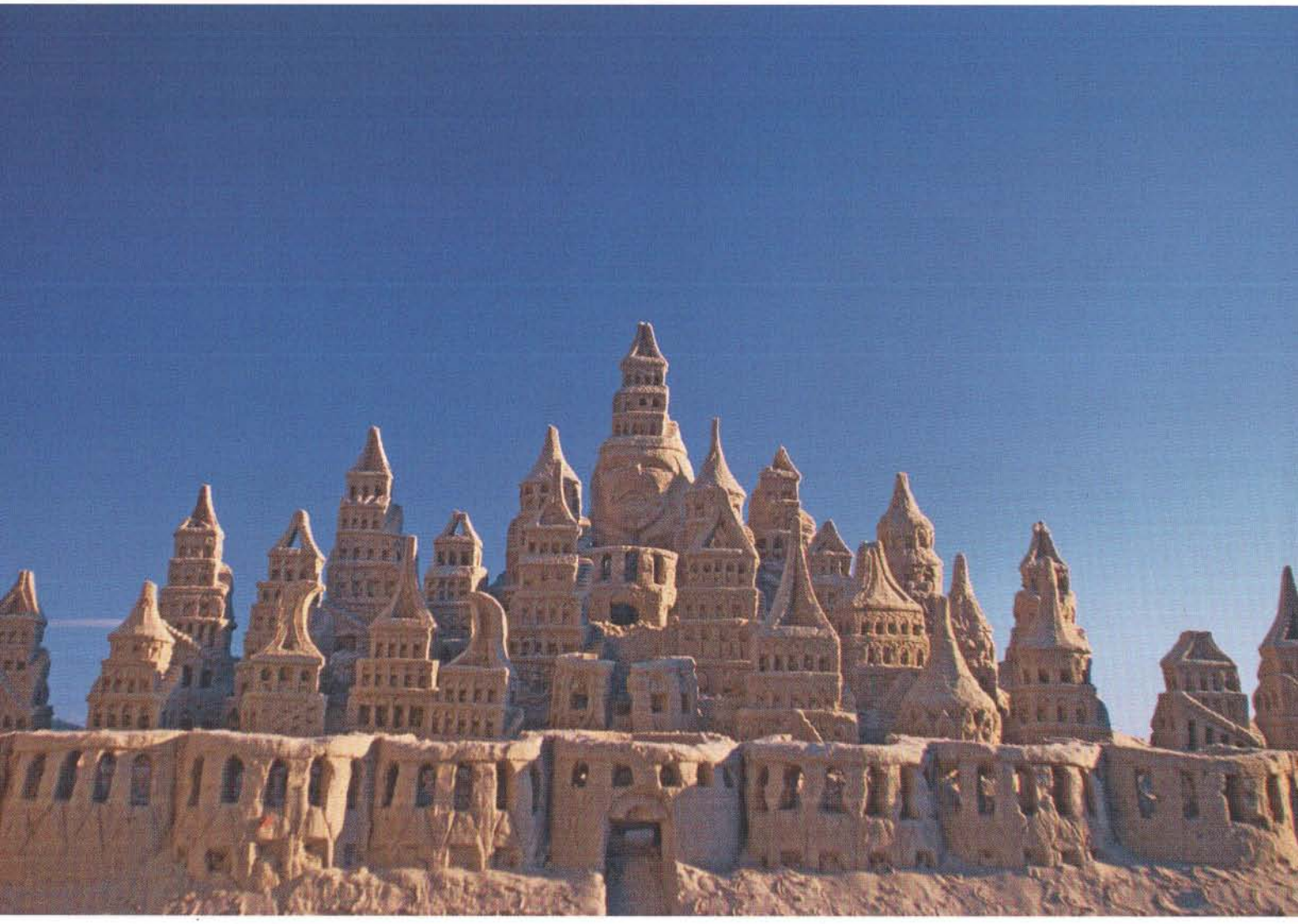

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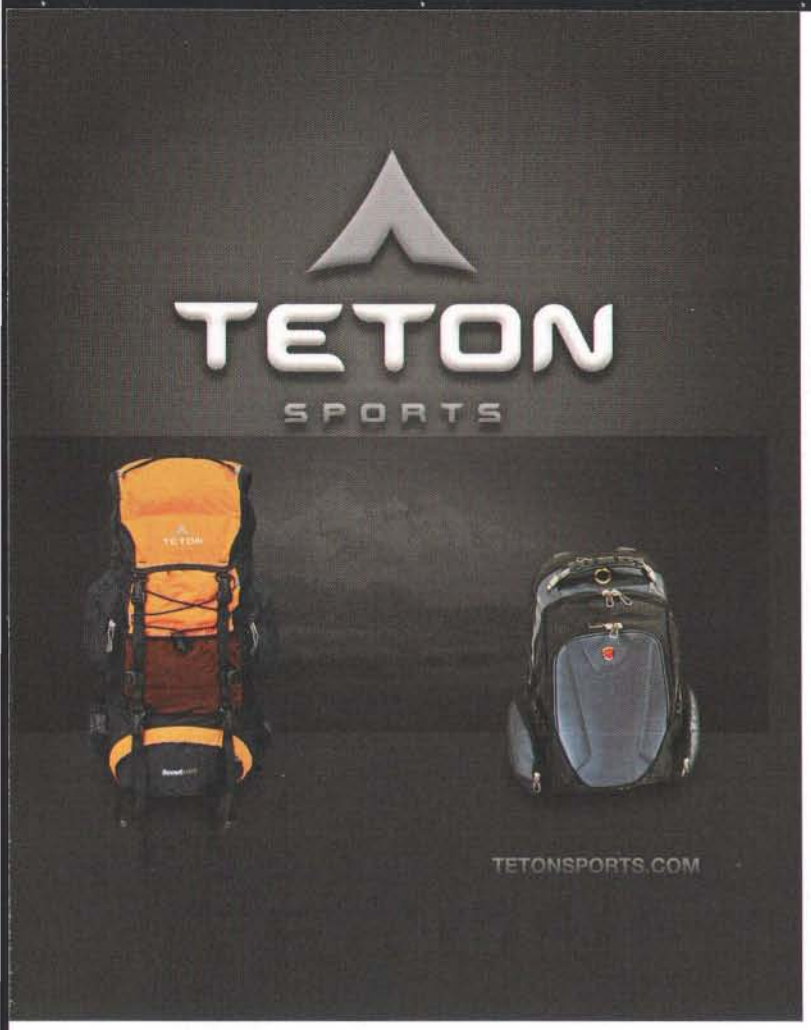

keyboard-driven big brother. Figure 5 shows SizeUp's many keyboard shortcut options for positioning windows.

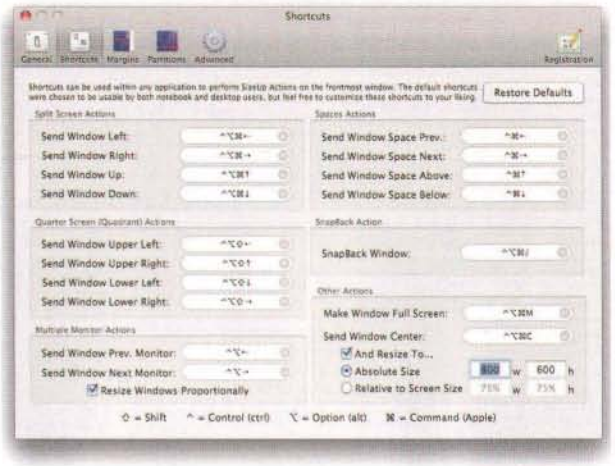

Figure 5-SizeUp's shortcut and window positioning options.

As you can see in Figure 5, SizeUp also has options for sending windows to other monitors and other spaces.

SizeUp's place is in having a few well-defined presets for window positions. While the positioning of windows can't have the breadth of variety that some of the other utilities I've references, the defaults are all well thought out. Some default options can be changed as seen in Figure 6.

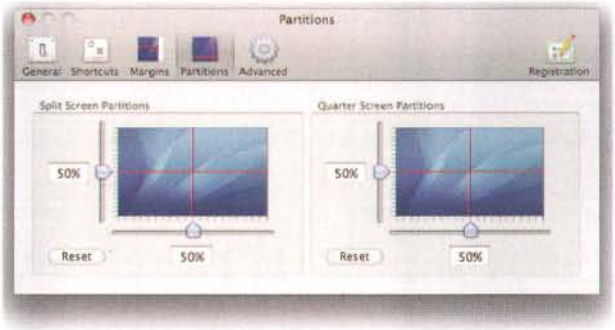

Figure 6-adjusting the default window positions in SizeUp.

One feature that I love in SizeUp is the ability to define margins. If you like a little breathing room for your windows, define a margin and they'll stand off of each other by your predefined amount.

SwitchResX

SwitchResX (http://www.madrau.com) is certainly the most mature of the utilities listed in this article. It's also a *little* different. Its primary function revolves around working with monitors and dealing with display resolutions.

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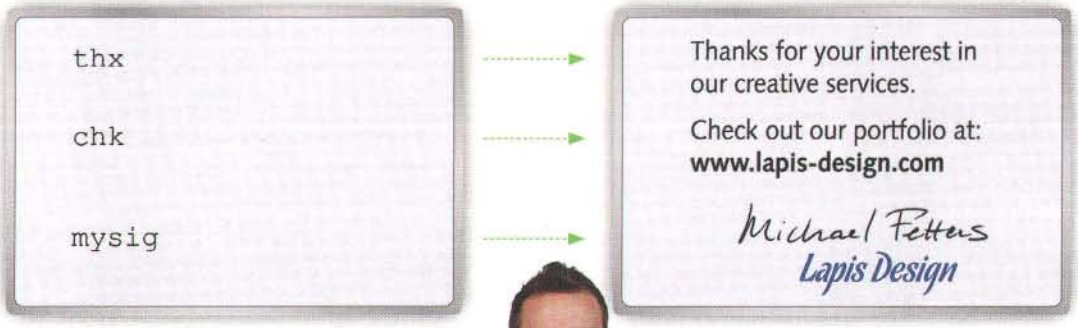

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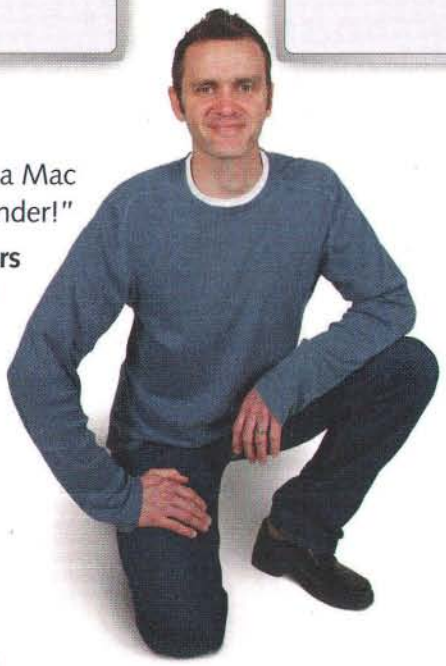
Mac user



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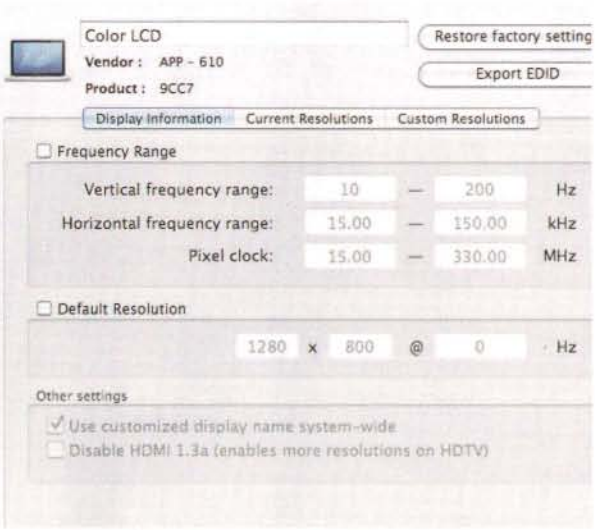

Figure 7-SwitchResX's display tweaking features.

I include SwitchResX here because it has some basic window management functionality, somewhat like Stay, described above. It has several advantages over Stay, though. One is that it can recall the windows of a particular application. It can also save all open windows (and the position of Desktop icons) on demand or upon switching resolutions.

SwitchResX has some other advanced features such as running a script on resolution change and is, itself AppleScript-able.

Conclusion

Keeping your hands on the keyboard increases your productivity. When you work in a shell, you get used to performing close to all actions with the keyboard only. There are ways to extend a portion of this to the GUI. The first great thing is that all of the utilities mentioned have trial modes that let you find the one that meets your needs and style. The second great thing is that once you find the utility you're looking for, every one mentioned in this article are completely affordable and you support independent development for a better Mac OS X.

Media of the month: "Here's Looking at Euclid: A Surprising Excursion Through the Astonishing World of Math," by Alex Bellos. Just a simple fun read about math.

I'm really looking forward to seeing everyone at MacTech Conference 2010. Until next month, keep up the keyboard skills!

About The Author

Ed Marczak is the Executive Editor for MacTech Magazine, and has written the Mac in the Shell column since 2004. Along with Greg Neagle, he recently co-authored, "Enterprise Mac Managed Preferences," which is available from Apress Publishing.

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Sharkfest 2010

The Annual Wireshark Network and Packet Analysis Conference

by Kok-Yong Tan

After a rather depressing Worldwide Developers' Conference (WWDC) 2010 without an I. T. track convened by Apple, I drove down the San Francisco Peninsula from San Francisco to Stanford University in Palo Alto looking forward to Sharkfest 2010. Admittedly, I managed to spend a lot more quality time with colleagues than normal during WWDC 2010 what with the paucity of functions normally thrown by many I.T.-centric organizations and I managed to indulge myself more fully in my hobby of checking out new and revisiting old dining haunts, but I had hoped for more than the largely iOS-centric sessions in WWDC this year. Oh well. Onwards and upwards.

Since its inception, Sharkfest has been a very small conference of perhaps 200 to 300 people at most. Also, it has been fortuitously scheduled every year for the week immediately following WWDC so it makes travel financially appealing as I can then make one trip to California from my home base in New York and I only have to adjust my internal clock once. While it is not the 5,000 person controlled chaos that is WWDC, it does not mean that the sessions are any less interesting. In fact, since it is not under NDA, I find it much more liberating than WWDC. Plus, I have found in the three years I have attended Sharkfest that the sessions are very in-depth and sometimes so much so that I have lots of "homework" to do afterwards to bring myself up to a fuller understanding of its content, which is good in and of itself since it forces me to realize how little I know and how much else there is left to learn in my chosen field. Computer Science, of which data networking is a part, is one of the few fields where you can actually meet the founders, inventors and other luminaries of the field. For instance, at one prior Sharkfest that I had the fortune to attend, Vint Cerf, one of the founding fathers of the Internet delivered an opening keynote speech. At this year's Sharkfest, Van Jacobson, the author of tcpdump (an invaluable tool now bundled with MacOS X and most other flavors of Unix and Linux operating systems for network packet capture, analysis and just plain debugging) delivered the opening keynote. Then one of the presenters at this year's Sharkfest was Gordon "Fydor" Lyon, the author of nmap! Not to mention Mike Kershaw, the author of Kismet. It was meeting and talking to living legends—much more interesting than any Hollywood celebrity! Try meeting and having a chat with Marie Curie if you are a physicist! Or Albert Einstein! Not without a successful séance!

Conference Logistics

As per the last three Sharkfests where there were opening festivities, this one opened with the "Monday Night Fiesta" (which was both a welcome party and handled registration for the conference) and held in front of the Stanford Art Gallery building in a shady outdoor open area named Dohrman Grove.

Monday Night Fiesta and Conference Registration at Dohrman Grove, Stanford University

For a change, direct shuttle transport was provided from the conference hotels and this, in my humble opinion, was one of the greatest timesavers of the conference. One cannot truly appreciate the immensity of the Stanford University campus until one has to merely walk from the designated car park to the location where Sharkfest is held, especially when Stanford tightly regulates car parking and encourages bicycles as the main mode of transport. It

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boggles my mind when I hear of attendees walking from their hotels every day, but more power to them.

View from Memorial Quad of Memorial Church, Stanford University

Last year, I made the mistake of driving onto campus: The drive from my hotel to the designated car park took 5 minutes but the walk from the car park to the conference site took 20 minutes through unseasonably hot weather even after I had figured out the best route between any two locations. It certainly brought back memories of forced route marches with full kit from my days in the infantry, I can tell you, and they were **NOT** happy memories!

View of the Sheraton Palo Alto's Water Garden

If you stay at the main conference hotel, the Sheraton Palo Alto, there is almost no need to rent a car as CalTrain's Palo Alto station is situated literally smack dab at the back entrance of the hotel property and that entrance is at most a hundred feet from the hotel building itself: One can easily trundle any luggage through the back gate into the hotel building. There are transfer points between the BART network and the CalTrain network at the Millbrae Transit Center for anybody arriving at San Francisco International (SFO) or Oakland Airports (OAK) (requires an transfer from the AirBART bus between Oakland Airport and the BART

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    contact_visitors = yes;
    real_time = of_course;
    try_visistat = free;
    setup = no_brainer;

}
else {

    no_clue = true;
    i_use_google = sorry;

}

//REAL-TIME WEBSITE TRACKING
goto = www.visistat.com;
```

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Coliseum station) and there is a bus called the "Airport Flyer" connecting San Jose's Mineta Airport (SJC) to the CalTrain station at Santa Clara. Alternatively, if you wish to drive, the Sheraton Palo Alto has no lack of car parking space around the back of the hotel and you can avail yourself of either valet or self parking (your room key is what is used to swipe yourself into the parking lot around back). Apart from being very conveniently situated, the Sheraton Palo Alto is a very idyllic corner of the world, what with its Water Garden and Koi ponds. The only caveat is that one should ask for rooms that face the Water Garden and not the train tracks since that can get rather noisy from what I have overheard while in the hotel bar. In the two years that I have attended Sharkfest held at Stanford University and stayed at the Sheraton Palo Alto, I have heard nary a peep from the trains coming and going when staying in a room facing the Water Garden. What should also be noted is that a couple of routes on the free regular Stanford University shuttle service have stops at the CalTrain station and while these routes would eventually pass by the conference site, the shuttle buses take longer to get there since they have to cover other sections of the Stanford campus as part of their regular route.

As such, the direct shuttles to the "Monday Night Fiesta" with its open bar and food were greatly appreciated and the mariachi band was rather good. Unfortunately, there was a glitch with the direct shuttle arrangements but it got straightened out through the Herculean efforts of the conference organizers, specifically Janice Spampinato and Sheri Najafi. The reasoning for the glitch provided to the conference organizers was so bizarre that it bears repeating here in print. It seemed that the bus drivers, having taken it upon themselves to arrive inordinately early—an hour ahead of schedule (despite it being clearly documented on their call sheets)—also decided to leave inordinately early…before the last session for the day ended! In hindsight, the illogic behind those thought processes (and what could have caused it) would have been hilarious if it were not so annoying to all and sundry affected at the time.

Attendees come from all over the world besides the United States and they have included those from Mexico, Japan, Switzerland, Belgium and the Netherlands. They also come in all skill levels so anyone contemplating attending a future Sharkfest should not view this as a deterrent.

So, What Is Sharkfest About, Anyway?

If you do any work in the data network arena and the thought of compiling (building) your own tools does not fill you with soul-quivering fear, then you might have heard of a software tool called Wireshark used for packet analysis and capture. It used to be known as Ethereal but various legal issues resulted in it being renamed. There are multiple ways to install it on your system but they deviate from the focus of this article. Suffice it to say that Wireshark is a Unix X-window application that allows you to better visually and graphically analyze network traffic and potentially solve problems if you know what you are doing and seeing. Since Mac OS X has the ability to run multiple windowing servers concurrently with its native Aqua, Wireshark, once compiled, works flawlessly on an Apple platform concurrently with your usual applications. I have successfully run and used Wireshark on Mac

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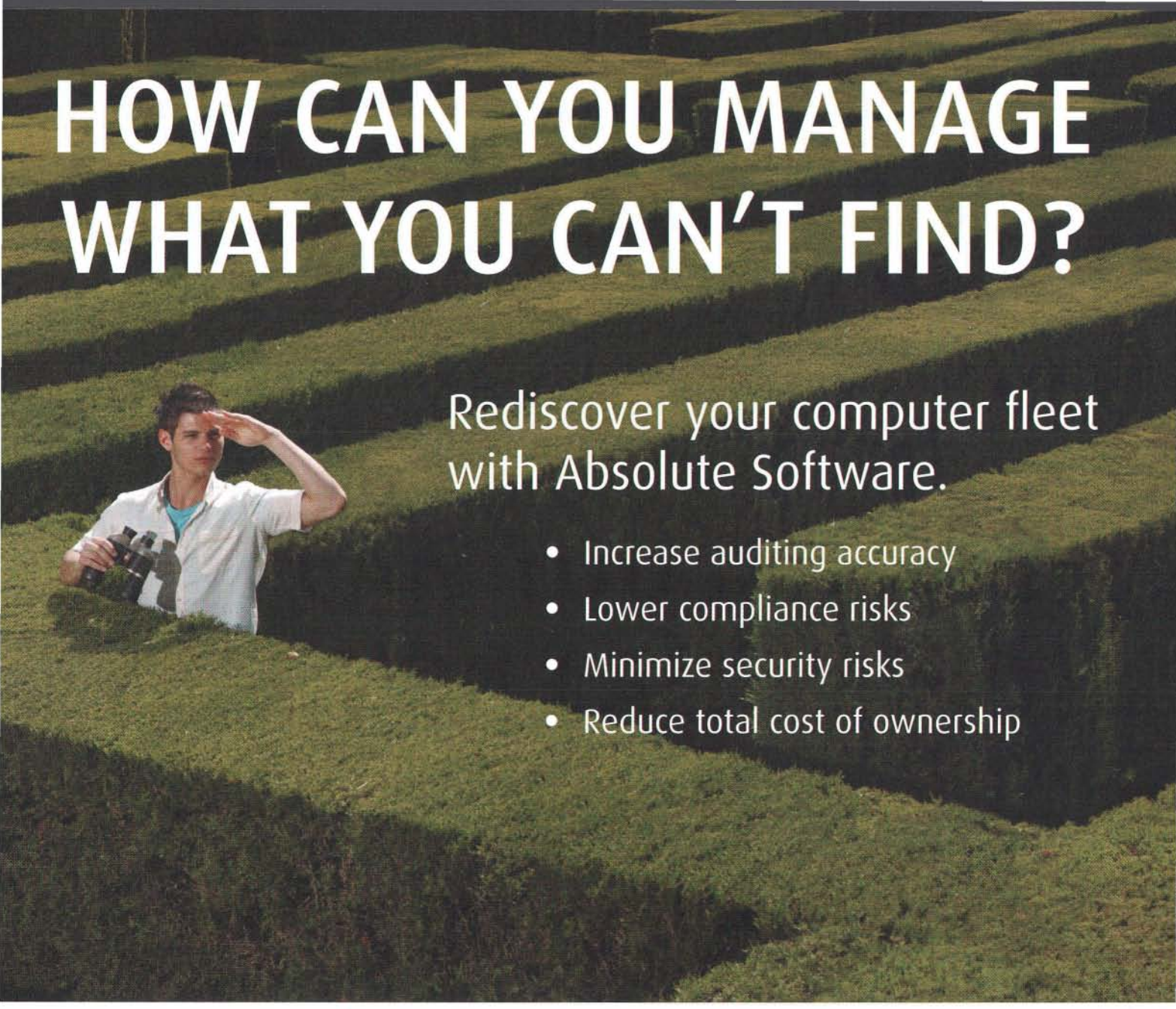

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OS X from Tiger, through Leopard to Snow Leopard. It has a very Unix-y look and feel but that does not detract from its functionality.

Since using Wireshark effectively requires some knowledge of platform independent data networking (and sometimes platform dependent quirks in their TCP/IP stacks) and the principles behind it, this is where Sharkfest comes in. At Sharkfest, there are a plethora of platforms from Windows through Linux to MacOS X as the thrust is about networking, which is mostly platform independent if you are working with TCP/IP.

The topics range from the very esoteric to the very basic and while it differs each year, the information imparted can be understood if you have a technical background in data networks (i.e., you at least know there is a seven layer OSI model and you have at least heard of layers 1, 2 and 3 and know what they do). Of course you would appreciate the conference a lot more if you have a greater understanding of network theory and practice and it behooves you to RTFM (this is still a geek conference and all geeks and wannabe geeks have to RTFM) and do the requisite study on your own. That said, everybody has to start somewhere. In any case, Sharkfest is normally broken up into three distinct and concurrent tracks: Basic User, Advanced User and Developer/Advanced User. The conference organizers are always tinkering with the format and this year, individual sessions were expanded to one hour and fifteen minutes and the number of sessions per day reduced from five to four as there was feedback from last year that the sessions were too short for the content. It appears that this length of time is the sweet spot as there was no rushing through of any of the presentations I attended and most presenters finished on time. What was unusual this year was that there were two keynotes: One at the beginning of the conference and one at the end as a "cap off." It did not make much difference to me as I am ambivalent about the number of keynotes.

As per previous years, some sessions require a software development background (e.g., "Writing Wireshark Dissectors and Plug-Ins," etc.) while others (e.g., "802.11 Secrets Revealed—RF Signal Propagation," etc.) assume you still remember the basics from your college classes in electromagnetism and maybe radiative physics. Of the hands-on sessions, most of them were Windows-centric although non-Windows users could follow along from the slides. There are a couple of very entertaining yet very instructive presenters who have held sessions at Sharkfest over the years and they are Laura Chappell, Hansang Bae and Joe Bardwell. If you have a chance to attend Sharkfest, I would highly recommend attending any of their sessions and planning the rest of your schedule around them. Despite doing so religiously for the past three Sharkfests, I have yet to come away without learning something new about Wireshark or networking each time. That is not to say I learned any less from the other presenters: Just that I may not have been as entertained.

You might learn how to use Wireshark and other tools effectively (e.g., "10 Cool Things You Should Know How To Do with Wireshark," "Using Wireshark Command Line Tools & Scripting," etc.). You might learn the basics of what is normal, what is abnormal and what to look out for when you are analyzing packet traces (e.g., "Basic TCP/IP Analysis," "Death of a Network—Identify the Hidden Cause of Crappy Network Performance," etc.). You might add to your knowledge about packet analysis if you are not a beginner (e.g., "Advanced Threat Intelligence and Session Analysis," "VoIP Troubleshooting," "Discovering IPv6 with Wireshark," etc.). You might learn about wireless infrastructure design (e.g., "WLAN 802.11n MIMO Analysis," etc.). You might learn about wired infrastructure design including practical security tips (e.g., "Network Access Security—It's Broken, Now What?" etc.). You might get to talk to the authors of various utility software that you might have come to take for granted in your daily life and perhaps provide feedback on what might become a new feature. It is the highly laudable aim of the organizers to avoid having presentations that are too device specific or to have product manufacturers hawk their wares during Sharkfest proper as there is now a trade event held after hours for this (i.e., no marketing fluff). With the large number of experts and such a small number of attendees, there are chances to buttonhole one or more of them for a chat on specifics of a problem if they are so inclined.

In the evenings, there are usually either organized functions such as pub-crawls, dinners or the sponsor-hosted cocktail reception and trade event (I placed an order for a very handy bit of hardware for packet analysis for a very inexpensive price while circulating socially and stuffing my face). Or, if you have a car, you can find your own dinner in the surrounding area (I discovered a very good Malaysian restaurant in nearby Milpitas).

Does this mean that you will walk away from the conference as an "instant expert"? No. Does this mean that you will walk away from the conference with at least some useable knowledge that you can apply in your work and some homework to do? Most likely, even if you only handle solo users in an isolated environment for they, too, must access the Internet and you might have occasion to use the knowledge you gleaned here. All of this in a very collegial and relaxed setting at Stanford University, if a three-day intense conference can be called such! With luck, you will find the time and finances to attend Sharkfest 2011…

MT

About The Author

Kok-Yong Tan hails from Singapore but has lived in New York City since 1984. After graduating with a degree in Computer Science from Columbia University and initially working for Merrill Lynch as a programmer in its Fixed Income Analytics Group, he now runs his own consulting firm, Reality Artisans, Inc. He likes the city because there are already so many other weirdos that nobody seems to notice his trademark getup of solar-powered pith helmet and heavily-laden multi-pocketed vest. He ended up in systems and network administration because he was ordered by his then-boss at Merrill Lynch into that abyssal pit as part of the "team player" creed and he has yet to find his way back out. He is now contemplating clawing his way back into programming as a means of avoiding the PEBKAC crowd but has temporarily deviated from that path into network design, analysis and troubleshooting.

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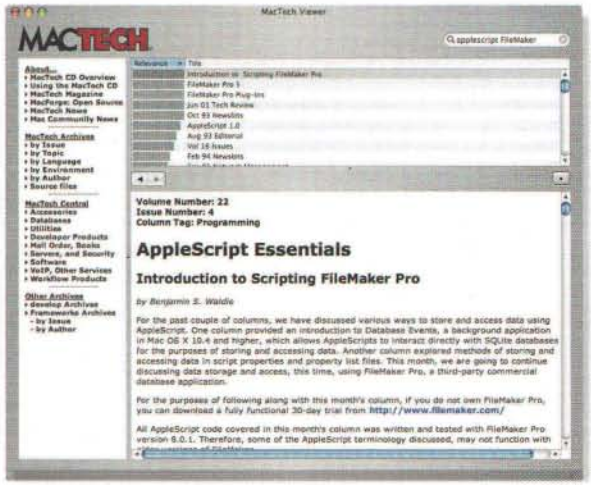

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Scripting with SatImage, Part 2

More about the SatImage scripting addition

by José R.C. Cruz

Introduction

Last time we looked at the SatImage scripting addition, we studied its ability to search and replace sections of text. We learned how it uses regex patterns to do the search and how it extracts portions of a given text. We even learned how the addition converts the text from one form to another and how it reformats real number values into text values.

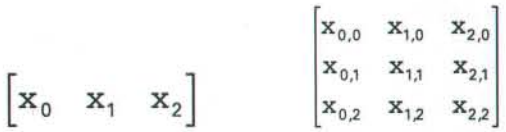
Afterwards, we studied the many ways SatImage can interact with the scripts' users and files. We learned the various dialog windows it uses to prompt the users, then the various tasks it invokes to work the files.

Now, we will examine those abilities that give SatImage a more scientific bent. First, we study how SatImage creates and manages arrays and matrices. Next, we survey its rich set of math functions and see how each function works with number data.

Once again, readers are expected to have a working knowledge of core AppleScript and of the Script Editor utility. The scripts featured in this article are all available from the MacTech website at ftp://ftp.mactech.com. Additionally, the SatImage OSAX used in this article can be downloaded from the page at http://www.satimage.fr/software/en/downloads/downloads_companion_osaxen.html.

On Arrays and Matrices

Some technical data are best organized as either arrays or matrices (Figure 1). An *array* is just a linear sequence of data. The first datum of that sequence gets an index value of zero. A *matrix*, on the other hand, is an array of two or more arrays. Here too, the first datum of each array gets an index value of zero. The first array of the matrix also gets an index value of zero.



(a) an array (b) a matrix

Figure 1. Samples of arrays and matrices.

Now we could use a list object to hold our array or matrix data. But a list is too slow, too resource-hungry for anything but the simplest technical problem. A better, faster way is to use SatImage itself for creating and managing our arrays and matrices.

SatImage expects its array and matrix objects to hold only real number values. If the value is an integer number, SatImage will coerce it into a real. If it is a non-number value, SatImage will use the placeholder token `'missing value'`.

Unless stated otherwise, SatImage processes array data on a left-to-right direction. It processes matrix data on left-to-right, top-to-bottom direction.

To make an array

Simplest way to make an array object is to coerce a list of numbers using the SatImage noun `array of real`. Assume our list is the one shown below:

```
set tLst to {1.0, 2.1, 3.2, 4.3, 5.4}
```

To turn it into an array, use the above noun as follows:

```
set tArr to tLst as array of real
(*
```

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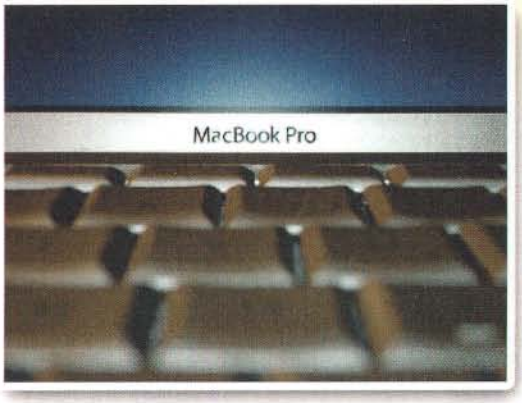

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```
returns
    «data
Lido4E6F742061207265636F7264646F75623FF00000000000004000CC
CCCCCCCCCD4009999999999999A401133333333333334015999999999
99A»
*)
```

The result is a *packed binary stream*, which is not viewable from the Script Editor. To turn it back into a list, use the noun `list of real` as follows:

```
tArr as list of real
— returns {1.0, 2.1, 3.2, 4.3, 5.4}
```

Another way to make an array object is with the SatImage verb `createarray` (Figure 2). The verb takes one input argument: the array size. So to make an array of *five* values, use the verb as follows:

```
set tArr to createarray 5
tArr as list of real
— returns {0.0, 1.0, 2.0, 3.0, 4.0}
```

The verb returns an array with reals ranging from 0 to 5. To use a different range, pass the range as a list to the option `range`:

```
set tArr to createarray 5 range {1.0, 5.0}
tArr as list of real
— returns {1.0, 2.0, 3.0, 4.0, 5.0}
```

`createarray` *`array-size`* [**`range`** *`minmax-list`*]

Figure 2. The `createarray` verb.

A different way of making an array object is with the `randomarray` verb (Figure 3). This too takes the array size as its sole input. The array values are, of course, randomized and always fall within 0 and 1.

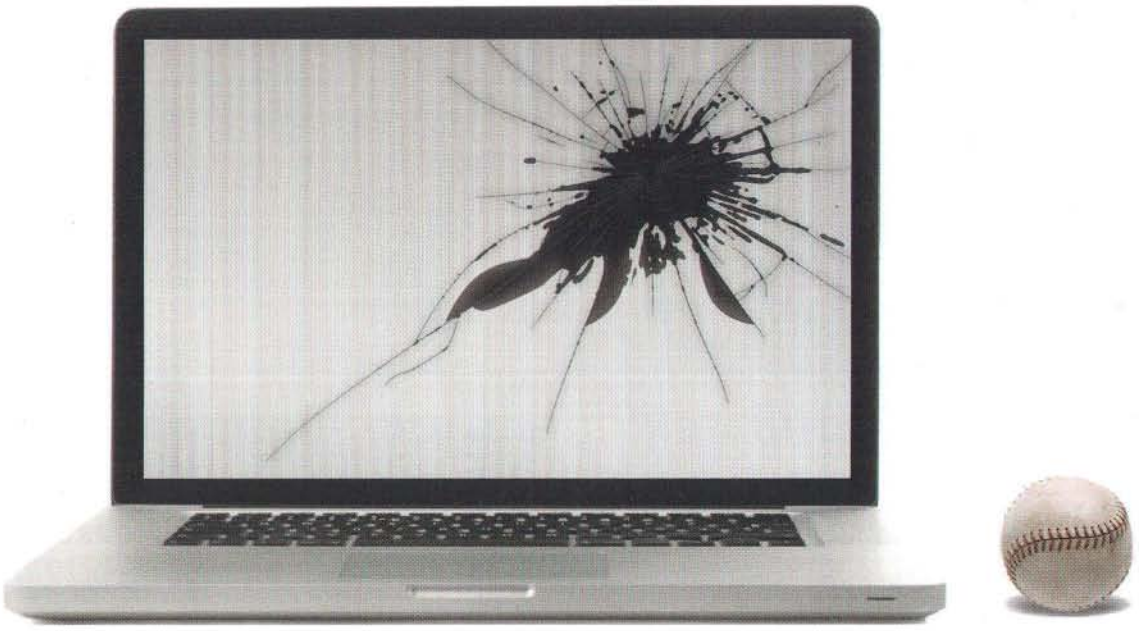
```
set tArr to randomarray 5
tArr as list of real
— returns {0.193811763311, 0.016256768024, 0.299856256461,
0.200934242224, 0.038976925192}
```

To specify a different range, pass the range as a list to the option `range`.

```
set tArr to randomarray 5 range {1, 2}
tArr as list of real
— returns {1.404157594312, 1.152104659239, 1.045181623194,
1.444150524447, 1.684070993913}
```

`randomarray` *`array-size`* [**`range`** *`minmax-list`* | **`seed`** *`seed-integer`*]

Figure 3. The `randomarray` verb.



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Using the **randomarray** verb again will give an array with a different random sequence, even if the array size stays the same. To make the verb give the *same* sequence, pass an integer to the option **seed**:

```
set tArr to randomarray 5 seed 5
tArr as list of real
— returns {0.221993171377, 0.055180120748, 0.870732303476,
0.831327839987, 0.206719154026}
```

This sets the SatImage random generator with the same starting value. Using the same seed will always result with the same random sequence.

To make a matrix

A simple way to make a matrix is to coerce a list object with the noun **matrix**. This time, the list must be a sequence of two or more sub-lists, with the first sub-list being the first row of the matrix:

```
set tLst to {{1, 2, 3}, {4, 5, 6}, {7, 8, 9}}
set tMat to tLst as matrix
(*
— returns
    {class:matrix, ncols:3, nrows:3
    , array of real:«data
Lido4E6F742061207265636F7264646F75623FF00000000000004010....
»}
*)
```

The resulting matrix object is a record of four fields. The **class** field gives the object type, which is always set to matrix. The fields **ncols** and **nrows** give the number of columns and rows that make up the matrix, and the field **array of real** gives the matrix data itself as a packed binary stream.

Unlike the array object, we cannot easily coerce our matrix back to the original list of sub-lists. If we try to coerce the object into a list, we only strip out the labels from each record field:

```
tMat as list
(*
— returns
    {matrix, 3, 3
    , «data
Lido4E6F742061207265636F7264646F75623FF00000000000004010....
»}
*)
```

If we coerce the data portion of the matrix object, we get a single list of reals, not the desired list of sub-lists:

```
array of real of tMat as list of real
— returns {1.0, 4.0, 7.0, 2.0, 5.0, 8.0, 3.0, 6.0, 9.0}
— does not returns {{1, 2, 3}, {4, 5, 6}, {7, 8, 9}}
```

Keep this in mind when tracking your matrix results.

A second way to make a matrix object is with the verb **creatematrix** (Figure 4). The verb takes three input arguments: the type string, the number of rows and the number of columns. To create a unity matrix, one where all its values are set to one, pass the string **"1"** as the type. This snippet returns a unity matrix three rows tall and three columns wide:

```
set tMat to creatematrix "1" ncols 3 nrows 3
```

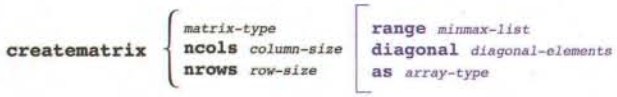

Figure 4. The `creatematrix` verb.

To create a constant row matrix, where each row contains the same values, pass an **"x"** for a matrix type:

```
set tMat to creatematrix "x" ncols 3 nrows 3
```

Conversely, to create a constant column matrix, pass a **"y"** as the type:

```
set tMat to creatematrix "y" ncols 3 nrows 3
```

To create a diagonal matrix, where non-zero values lie solely on the diagonal, pass **"d"** as the matrix type:

```
set tMat to creatematrix "d" ncols 3 nrows 3
```

The **creatematrix** verb uses the **ncols** and **nrows** values to prepare the initial matrix values. To use your own range of values, pass a list of reals to the **range** option:

```
set tMat to creatematrix "x" ncols 3 nrows 3 range {1, 1.5}
```

If you are making a diagonal matrix, pass a list of reals to the **diagonal** option:

```
set tMat to creatematrix "d" ncols 3 nrows 3 diagonal {2, 3, 4}
```

Make sure the number of reals in the list matches the number of diagonal values. Otherwise, the **creatematrix** verb will respond with an error code of **-50** (parameter error). So, in the above snippet, the diagonal matrix expects a list of three real values exactly.

Working with arrays and matrices

Several verbs of the SatImage addition provide the means to manage an array object. Some also work with matrix objects, with minor differences in behavior and results. For instance, the verb **reversearray** takes an array object and reverses the order of its values:

```
set tLst to {1.0, 2.1, 3.2, 4.3, 5.4}
set tArr to tLst as array of real
set tNew to reversearray tArr
tNew as list of real
```

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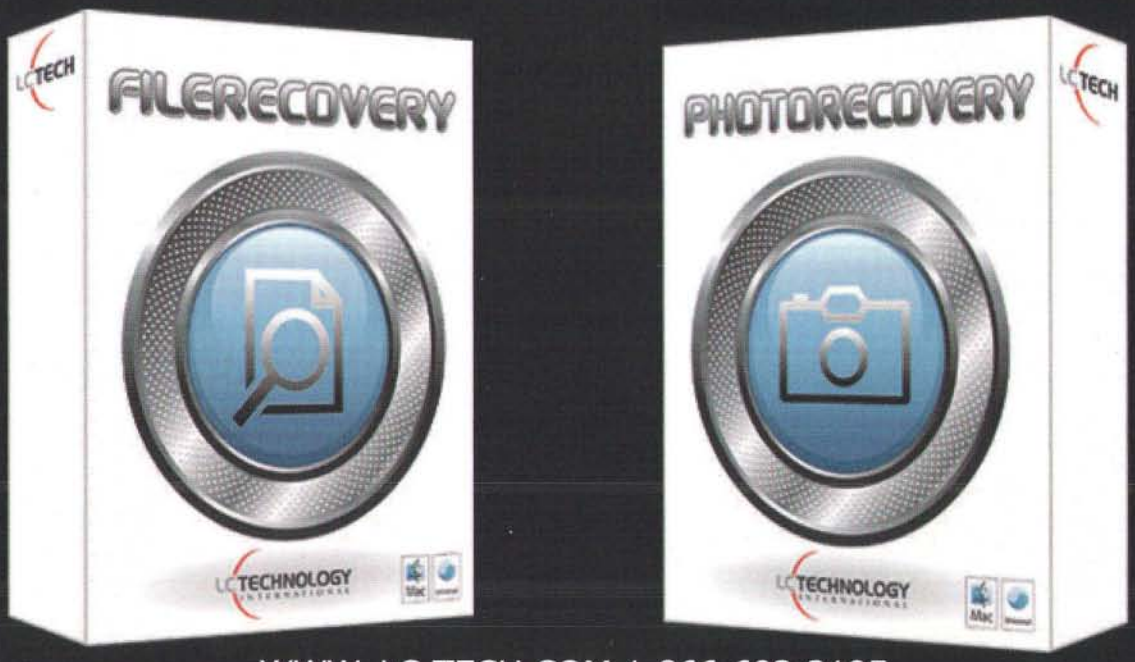

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— returns {5.4, 4.3, 3.2, 2.1, 1.0}

If applied to a matrix, the verb reverses the order of values in each row.

The verb `runningsum` adds each array value with the previous value. Then it replaces the current value with the sum. The same also happens on a matrix object, but on a per-row basis:

```
set tLst to {1.0, 2.0, 3.0, 4.0, 5.0}
set tSum to runningsum tArr
tSum as list of real
— result {1.0, 3.0, 6.0, 10.0, 15.0}
```

The verb `changearray` uses values in one array to *replace* those in another array. It replaces each value in a *left-to-right* direction and returns the results as a separate array.

```
set tOrg to {1.0, 2.0, 3.0, 4.0, 5.0} as array of real
set tNew to {2.0, 4.0, 6.0} as array of real
set tChg to changearray tOrg into tNew
tChg as list of real
— returns {2.0, 4.0, 6.0, 4.0, 5.0}
```

The verb also starts the replacement at index 0 of the array. To use a different index, pass the index to the option `at`:

```
set tOrg to {1.0, 2.0, 3.0, 4.0, 5.0} as array of real
set tNew to {2.0, 4.0, 6.0} as array of real
set tChg to changearray tOrg into tNew at 2
tChg as list of real
— returns {1.0, 2.0, 4.0, 6.0, 5.0}
```

Make sure the new index is less than the target array size. And make sure the replacement array is smaller than the target array. Otherwise, the verb will respond with a `-50` error. If this verb's target is a matrix, it converts the matrix into an array before performing the replacement. The matrix's values are read on a per-column basis, in a left-to-right direction (Figure 5). The verb, however, does not restore the modified data to its original matrix form.

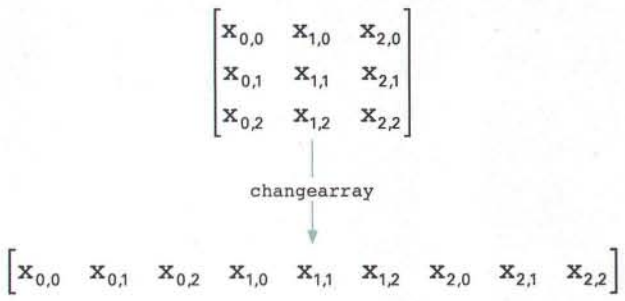

Figure 5. From matrix to array.

The verb `insertarray` takes the values of one array and *adds* them into the target array. The result is a new array much larger than the previous two:

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```
set tOrg to {1.0, 2.0, 3.0, 4.0, 5.0} as array of real
set tNew to {2.0, 4.0, 6.0} as array of real
set tChg to insertarray tOrg into tNew
tChg as list of real
— returns {2.0, 4.0, 6.0, 1.0, 2.0, 3.0, 4.0, 5.0}
```

Insertion starts at index 0 of the target array. To change the insertion point, pass the index to the option `at`:

```
set tOrg to {1.0, 2.0, 3.0, 4.0, 5.0} as array of real
set tNew to {2.0, 4.0, 6.0} as array of real
set tChg to insertarray tOrg into tNew at 2
tChg as list of real
— returns {2.0, 4.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0}
```

Here too, the verb converts a matrix into an array prior to insertion. And it does not restore the modified array back to the original matrix form.

The `extractarray` verb reads a value from the target array. By default, it returns the value located at index 0 of that target:

```
set tOrg to {1.0, 2.0, 3.0, 4.0, 5.0} as array of real
set tDat to extractarray tOrg
tDat as list of real
— returns {1.0}
```

To read from a different index, pass the index to the option `at`:

```
set tOrg to {1.0, 2.0, 3.0, 4.0, 5.0} as array of real
set tDat to extractarray tOrg at 3
tDat as list of real
— returns {3.0}
```

To read two or more values, pass the number of values to the option `for`:

```
set tOrg to {1.0, 2.0, 3.0, 4.0, 5.0} as array of real
set tDat to extractarray tOrg at 3 for 2
tDat as list of real
— returns {3.0, 4.0}
```

The verb returns the read values, even single ones, as an array.

Do The Math

Naturally, processing technical data often involve the use of math routines. Such routines are practically absent in core AppleScript or in Standard Additions. We could supply these routines as script methods, but doing so would make them too slow for regular use. A better approach is to rely on SatImage and its rich sets of math verbs.

Unless stated otherwise, all the verbs take a real value as input and give a real value as output.

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Ready the numbers

The first set of math verbs concerns itself with number preparation. The verb **abs** gives the number value itself, not its sign:

```
abs (100.5)
— returns 100.5
abs (-100.5)
— returns 100.5
```

The verb **ceil** rounds off the real number to the next *highest* integer value. The verb **floor** rounds it to the next *lowest* integer. Both verbs preserve the number's original sign:

```
ceil (100.5)
— returns 101
ceil (-100.5)
— returns -100
floor (100.5)
— returns 100
floor (-100.5)
— returns -101
```

The verb **trunc** chops off the fractional part of the real value. It returns the *integer part*, together with the number's original sign:

```
trunc (100.5)
— returns 100
trunc (-100.5)
— returns -100
```

We can also use the **trunc** verb to extract the *fractional portion* of a real value as shown below:

```
100.5 - (trunc (100.5))
— returns 0.5
-100.5 - (trunc (-100.5))
— returns -0.5
```

Numbers in a circle

Another set of math verbs provides *circular functions*, the type that involves angles and magnitudes—in other words, *trigonometry*. These functions are often used to describe tracts of land, determine force lines , or even calculate star positions.

For instance, the **sin** verb computes the sine value of a given angle. And the **asin** verb computes the angle given its sine value.:

```
sin (0.5)
— returns 0.479425538604
asin (0.479425)
— returns 0.499999386264
```

Both verbs expect the angles to be in terms of *radians*. This can be confusing as some angle measures are done in *degrees*, some in *gradients*. But we can convert these measures to the correct term using one of the routines shown in Listing 1.

Listing 1. Converting between radians, degrees and gradients.

```
on deg2rad for aAng
    return (aAng * pi / 180)
end deg2rad — for aAng

on rad2deg for aAng
    return (aAng * 180 / pi)
end rad2deg — for aAng

on grad2rad for aAng
    return (aAng * pi / 200)
end grad2rad — for aAng

on rad2grad for aAng
    return (aAng * 200 / pi)
end rad2grad — for aAng
```

The other four verbs that serve as circular functions include **cos**, **acos**, **tan**, and **atan**. There is also a similar set of verbs that map their angles and magnitudes on a hyperbolic curve. In this set are the verbs **sinh**, **asinh**, **cosh**, **acosh**, **tanh**, and **atanh**.

Another useful set of verbs deal primarily with *right triangles*. A right triangle has two of its sides placed at right angles to each other, that is 90 degrees (Figure 6). Opposite that right angle is the side called the *hypotenuse*, whose squared length is the sum of the squares of the other two sides.

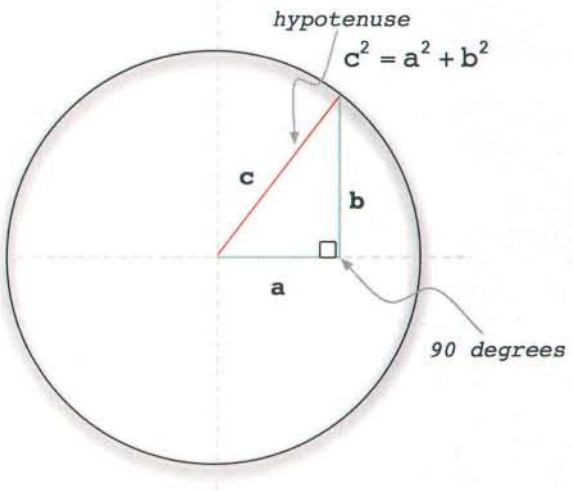

Figure 6. The right triangle.

To calculate the hypotenuse given the two sides, use the **hypot** verb. This verb takes the lengths of the other two sides as a list of reals.

```
hypot {1, 2}
— returns 2.2360679775
```

Then to calculate one of the sides given the other side and the hypotenuse, use the **sqr** and **sqrt** verbs as follows:

```
set tB to sqr (2)
set tC to sqr (2.2360679775)
sqrt (tC - tB)
— returns 1.0
```

Power to logs

The next set of SatImage verbs map real values to a logarithmic curve. A logarithmic curve has the unique trait of starting with a high rate of change, which slows with later real values. It is often used to describe natural events like bacterial growth and radiation decay.

The verb **ln** gives the logarithmic value of the given real. The verb **exp** gives the opposite result:

```
ln 1.6487212707
— returns 0.5
exp 0.5
— returns 1.6487212707
```

Both verbs base their results around the physical constant of **2.718281828**, also known as the *natural base*. In fact, we can approximate the result of the **exp** verb by using the **'^'** operator as follows:

```
2.718281828 ^ 0.5
— returns 1.648721270561
```

But the **exp** verb gives a faster and more accurate result.

The verb **log10** also gives the logarithmic value for the given real. This verb, however, base its calculations around the constant **10**:

```
log10 (2)
— returns 0.301029995664
```

To get the opposite result, use the **'^'** operator as follows:

```
10 ^ 0.301029995664
— returns 2.0
```

Array arithmetic

SatImage also supplies a set of four verbs that do basic math operations on two array objects. The verb **addlist** adds the values from each array and returns the sum as another array. The addition itself happens in a left-to-right direction:

```
set tA to {1, 3, 5, 7, 9} as array of real
set tB to {2, 4, 6, 8, 10} as array of real
set tSum to addlist tA with tB
tSum as list of real
— returns {3.0, 7.0, 11.0, 15.0, 19.0}
```

Make sure both arrays have the same number of values; otherwise, the verb will return a **-50** error (*parameter error*). If one of the array values is not a real number, the verb will return a **missing value** as the sum:

```
set tA to {1, 3, 5, 7, 9} as array of real
set tC to {2, 4, 6, 8, "a"} as array of real
set tSum to addlist tA with tC
tSum as list of real
— returns {3.0, 7.0, 11.0, 15.0, missing value}
```

The **sublist** verb subtracts the values from its two array objects and returns the differences in a separate array. The array after the verb itself is the *subtrahend*, that after the label **with** is the *subtractor*:

```
set tSub to sublist tA with tB
tSub as list of real
— returns {-1.0, -1.0, -1.0, -1.0, -1.0}
set tSub to sublist tB with tA
tSub as list of real
— returns {1.0, 1.0, 1.0, 1.0, 1.0}
```

The **multlist** verb takes the values from its two arrays and multiplies them. It too stores the products in another array:

```
set tMul to multlist tA with tB
tMul as list of real
— returns {2.0, 12.0, 30.0, 56.0, 90.0}
```

Finally, the **divlist** verb takes its two arrays and divides their values. The array after the verb becomes the *dividend*, that after the label **with** becomes the *divisor*. If one of the divisors is a zero, the verb gives a **missing value** as the result:

```
set tDiv to divlist tA with tB
tDiv as list of real
— returns {0.5, 0.75, 0.833333333333, 0.875, 0.9}
set tDiv to divlist tB with tA
tDiv as list of real
— returns {2.0, 1.333333333333, 1.2, 1.142857142857,
1.111111111111}
set tC to {2, 4, 6, 8, 0} as array of real
set tDiv to divlist tA with tC
tDiv as list of real
— returns {0.5, 0.75, 0.833333333333, 0.875, missing value}
```

Check the curves

One use for matrices is to hold sample data measured at specific intervals in an experiment. We may want to look for trends in the data with respect to a reference point like time. Or we may want to present the data in a suitable graphical form. This type of data processing is known as a *curve fit*.

The SatImage verb **fitpolynomial** (Figure 7.a) is what we use to perform a curve fit. The verb takes three input arguments: the data matrix and the polynomial degree. For a result, it returns a **fitrecord** object (Figure 7.b). In that object, the **fit result** field gives the coefficients of each polynomial term. And the **fit error** field shows how well the equation tracks the sample data.

Figure 7. To do a curve fit.

To perform a simple curve fit, assume we have the following data arrays:

```
set tX to {1, 3, 5, 7, 9} as array of real
set tY to {2, 18, 50, 98, 162} as array of real
```

Pass the arrays to the `fitpolynomial` verb and set the polynomial degree to *two*:

```
set tPol to fitpolynomial {tX, tY} degree 2
— returns {fit error:3.35373364693749E-14
— , fit result:{3.20300390736708E-14, -3.37188493388383E-14, 2.0}}
```

The resulting `fitrecord` object gives a very small fit error—in fact, it is practically zero. If we use the coefficients from the `fit result` field to construct our polynomial, we get the equation shown in Figure 8. Now we could ignore those coefficients that are much less than 10^{-6}, treating them as being practically zero. But for the sake of completeness, we will leave them as is.

$$y = 3.2030 \cdot 10^{-14} - 3.3719 \cdot 10^{-14} \cdot x + 2.0 \cdot x^2$$

Figure 8. The curve-fitting polynomial.

So how do we know if our polynomial gives the best visual fit? For that, we need the aid of a plotting tool such as Grapher. Launch Grapher and choose New Point Set from its Equation menu. Select the entry named `'Untitled Set'` and rename it as `Sample Data`. Click the Edit Points button. Carefully enter the data we used for the curve fit. Select the `'y='` placeholder and enter our polynomial equation. Click the View menu and choose the menu item Frame Limits.... Set the range for the x-axis to (-1, 10), for the y-axis to (-1, 175). If done correctly, we get a nice visual graph of both our sample data and our polynomial (Figure 9).

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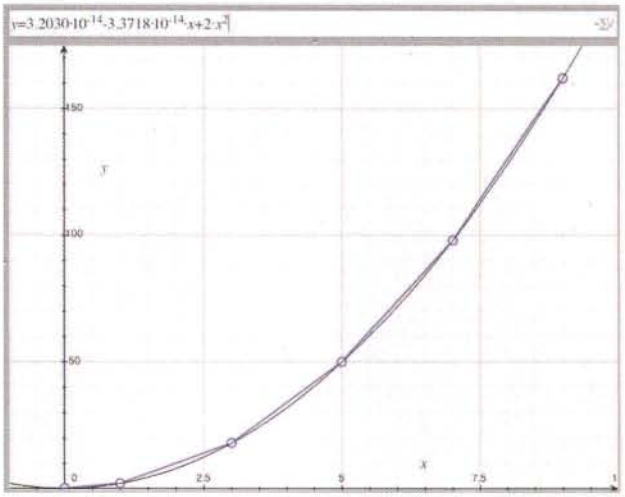

Figure 9. Testing the curve fit.

With polynomial on hand, we can compute for other data points that lie on the curve. This is done with the aid of the SatImage verb `evalpolynomial` (Figure 10). The verb takes two arguments: the array of coefficients obtained from the curve fit and a reference data point as a real. For example, this script snippet calculates the data point when `x` is equal to 2:

```
set tPol to fit result of tPol
evalpolynomial tPol at 2
— returns 8.0
```

And this snippet calculates the data point when `x` is equal to `10`:

```
evalpolynomial tPol at 10
— returns 200
```

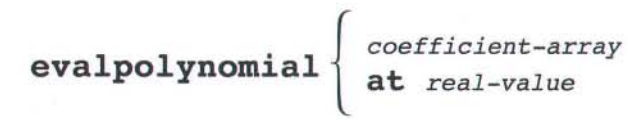

Figure 10. The `evalpolynomial` verb.

Finally, we can use SatImage to convert our array of coefficients into a Matlab-compatible equation string. To do so, first coerce the array using the `polynomial` noun. Then coerce the resulting object into a string.

```
set tEqu to tPol as polynomial
tEqu as string
— returns "3.203003907367075e-14-3.371884933883833e-
14*x+2.000000000000004*x^2"x
```

And we can use SatImage to combine two polynomials together. This is done with the composepolynomial verb, which takes two `polynomial` objects as input.

```
set tArr to {1, 2, 3} as array of real
set t2nd to tArr as polynomial
set tNew to composepolynomial t2nd with tEqu
tNew as string
```

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```
— returns "1.000000000000064-6.743769867768313e-
14*x+4.000000000000393*x^2
—                -4.046261920660607e-
13*x^3+12.00000000000005*x^4"
```

Note how the **polynomial** object places the constant coefficient at the left of the equation string and the coefficient for the largest term at the right.

Make the stats

Suppose our technical data consists of sample values taken at different points of a census or experiment. We may want to rate its efficacy or measure its distribution. For this case, SatImage gives us a set of two verbs with which we perform some basic statistics.

First, the verb **statlist**, takes the data as an array and computes its basic stats. Then it returns the results as a **statsrecord** object.

```
set tDat to {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15} ¬
    as array of real
statlist tDat
(*
— returns
    {maximum:15.0, maximum index:15, minimum:1.0, minimum
index:1
    , sum:120.0, mean:8.0, variance:18.666666666667,
stdev:4.320493798939
    , missing value:0}
*)
```

The **statsrecord** object divides the results into nine fields. The fields **maximum** and **mininum** shows the largest and smallest sample values, while the fields **maximum index** and **minimum index** shows their positions on the array. The field **sum** gives the total for the entire sample data, and the field **mean** gives their average value. The fields **variance** and **stddev** shows how much each sample value deviates from the mean. Finally, the field **missing value** gives the number of invalid samples.

For extra details, pass a true to the **statlist** option **kurtosis**. This adds three more fields to the resulting **statrecord** object:

```
statlist tDat kurtosis true
(*
— returns
    {maximum:15.0, maximum index:15, minimum:1.0, minimum
index:1
    , sum:120.0, mean:8.0, variance:18.666666666667,
stdev:4.320493798939
    , missing value:0, skewness:0.0, kurtosis:1.789285714286,
median:8.0}
*)
```

The **skewness** field shows the bias present in the sample data. A negative skew means the values are clustered closer to the maximum, a positive skew means the opposite. The **kurtosis** field shows how much of the sample data is distributed around its mid-point. It also hints at the overall shape of the sample distribution. And the **median** field gives the sample's mid-point (not to be confused with the

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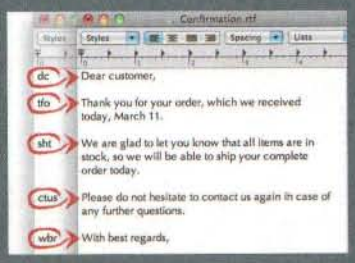

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sample's average or mean).

The second verb `histogram` divides the sample data into discrete groups called *bins*. For input, it gets the data array and the number of bins. For output, it gives a list of two sub-lists. The first sub-list is the *size of each bin*, the second sub-list is the *sample count* in each bin.

```
set tHis to histogram tDat samples 3
tHis as list of real
```

— returns {{3.333333333333, 8.0, 12.666666666667}, {5.0, 5.0, 5.0}}

Closing Remarks

That ends our coverage of the SatImage addition. In today's article, we learned how the addition lets us prepare data as an array or matrix object. We studied how to manipulate these objects and how to use them as part of a mathematical process. Next, we surveyed the many math-oriented verbs and nouns supplied by the addition. And we learned some of the quirks that these verbs display.

Once again, be sure to visit the SmileLab website for more information about SatImage or its companion products. The website URL is `http://www.satimage.fr/software/en/index.html`.

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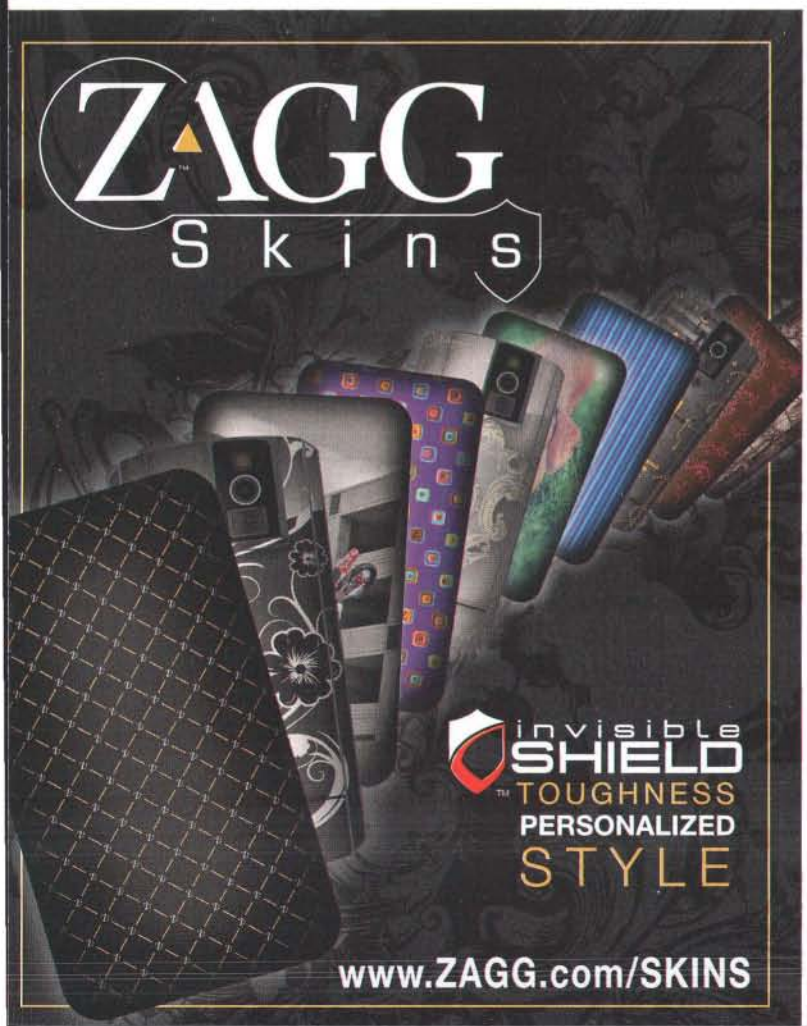
About The Author

JC is a freelance engineering writer from North Vancouver, British Columbia. He frequently contributes articles to MacTech and REALbasic Developer. He also wrote for the now defunct Python Magazine, and is now working on a database e-Book. When away from the writing pile, JC spends quality time with his charming foster nephew. He can be reached at anarakisware-at-gmail-dot-com.



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A Second Date with AAMEE

Revisiting Adobe Application Manager, Enterprise Edition

By Greg Neagle, MacEnterprise.org

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Mac OS X enterprise deployment project

Previously in MacEnterprise...

A couple of months ago, we looked at the Mac preview release of Adobe Application Manager, Enterprise Edition, or "AAMEE". This tool was designed to assist in enterprise deployments of Adobe CS5 products by creating an Apple Installer package that not only installs the Adobe products, but optionally includes a serial number and disables the end-user license agreement dialog, product registration reminders, and the Adobe Updater.

While strictly meeting the goals of creating an Apple package from Adobe install media, the preview release of AAMEE for Mac suffered from some significant shortcomings. Some of the most serious issues are listed next.

Packages generated with the AAMEE preview release would not successfully install when there was no user logged in via the GUI. This meant that automated deployments were unreliable – if there wasn't a logged in user when the automated deployment was attempted, the deployment would fail.

AAMEE preview release packages also refused to install from a mounted disk image. If you store your installer packages on a non-Apple filesystem, or make them available from a web server, you probably encapsulate the package inside a disk image file. This provides a single file to download and ensures that Apple-specific file system attributes are preserved. For almost every other installer package you will encounter or create, you can mount the disk image file and install directly from the mounted disk image. But the AAMEE preview release packages failed in the scenario.

Finally, AAMEE Preview Release for Mac provided no support for deployment of Adobe CS5 product updates.

In late June, after the earlier column on AAMEE was submitted for publication, Adobe released a "final" release of AAMEE 1.0 for the Mac. Let's see what's changed.

AAMEE 1.0 "Golden Master"

The major change announced for the "Golden Master" release of Adobe Application Manager, Enterprise Edition was that packages generated by AAMEE would now be able to be installed when there was no user logged in.

Unfortunately, my initial testing of this failed. With packages generated with the AAMEE preview release, if there was no logged-in user, the install failed before even starting. The attempted install failed with "Exit Code: 7 – Unable to complete Silent workflow." With the new release, installation started, but hung indefinitely while trying to install Adobe Help if there was no current user. Adobe was able to replicate this issue and confirmed that it was related to the Adobe Help installer. They also claimed that the only supported workflow was to use Apple Remote Desktop to install the package remotely, and when done this way, AAMEE-1.0 packages would install successfully when there was no user logged in. Since my organization does not own any licenses for ARD, I was unable to test that workflow, but I'll take Adobe's word for it that it works.

Instead, for my testing I was trying something that I thought was much simpler. I copied the CS5 installation package to a Mac. From a second Mac, I used SSH to connect to the first Mac. I then used the command-line `/usr/sbin/installer` command to attempt to install the CS5 package. This technique works with virtually every other package I've tried, as well as with the Adobe CS3 and CS4 deployment tools. Yet it fails with AAMEE-1.0-generated packages.

After much experimentation, I was able to get an install of an Adobe CS5 product to succeed, even when no user was logged in, by watching the install and killing the "Install Adobe AIR" process whenever it appeared in the process list. This had the unfortunate side-effect of preventing the install of Adobe Help and Adobe Media Player. This wasn't as bad as it sounds. We have no need for the Adobe Media Player in our environment, and it turns out that when Adobe Help is not installed, CS5 application help is displayed in the user's default browser. Working with some people at Adobe, I was able to find an even better workaround that even allowed Adobe Help and Media Player to successfully install.

A second issue remained. AAMEE-1.0-generated packages still balked at being installed from mounted disk images. This, too, I was eventually able to work around. For this issue, I created a temporary directory on the local disk, then symlinked several directories and tools from inside the mounted disk image to the

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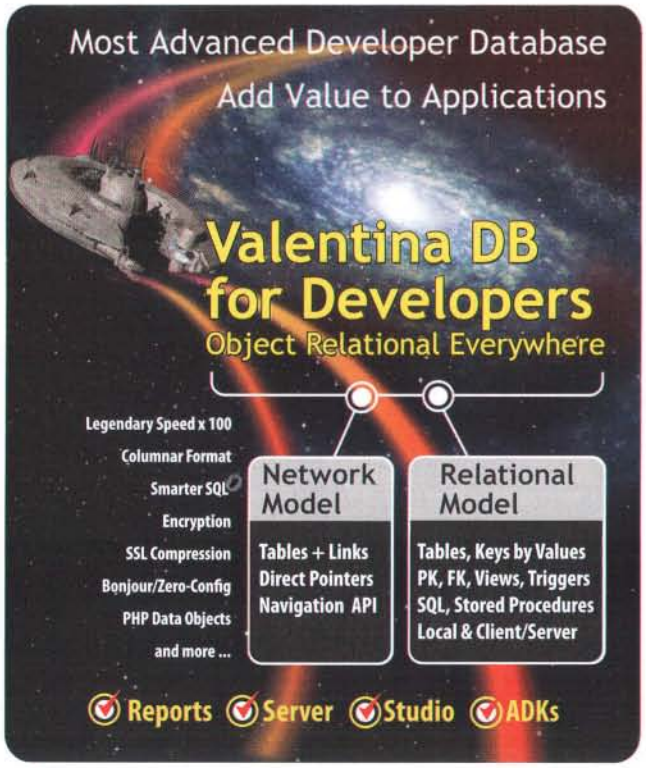
temporary directory on the local disk. I then directly invoked the AdobeDeploymentManager tool, passing it the paths to the symlinked directories on the local disk. This tricked the Adobe deployment tools into thinking the install media was on the local startup disk instead of on a disk image and allowed the install to succeed, even from a mounted disk image. Of course, an even more direct workaround would be to simply copy the contents of the disk image to the local disk before installing.

I've given a general description of how I worked around the issues I still encountered with AAMEE-1.0-generated packages. Further detail on these workarounds is probably unnecessary, as in practice you will probably not encounter these issues, or will not find them to be a problem for your deployment. If you use Casper, Absolute Manage, Apple Remote Desktop, or munki, you will find that the current versions of all of these products are now able to deploy Adobe CS5 products packaged using AAMEE 1.0 for Mac, even when there is no logged-in user.

More information on deploying Adobe CS5 products with common deployment tools:

Casper
http://www.jamfsoftware.com/solutions/adobe-creative-suite-5/
Absolute Manage/LANrev
http://www.absolute.com/Shared/Datasheets/Abt-AdobeCS5-Info-E.sflb.ashx
Munki
http://code.google.com/p/munki/wiki/MunkiAndAdobeCS5
http://code.google.com/p/munki/wiki/MunkiAndAdobeCS5Updates
Apple Remote Desktop (covered in Adobe's CS5 Deployment Guide)
http://www.adobe.com/devnet/creativesuite/pdfs/DeployGuide_CS5.pdf



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The Future of AAMEE and Adobe Deployment

Adobe is hard at work on future enhancements to AAMEE. They've acknowledged the issues with Adobe AIR/Adobe Help and installing from a disk image, and hope to address these in future releases. But they also plan to address some additional shortcomings we identified earlier.

A future release of AAMEE (which hopefully by the time this column sees print will actually be a current or prior release of AAMEE) will support packaging updates to Adobe CS5 products. You will be able to package the updates individually, in combination with other updates, or in combination with Adobe CS5 products.

I'm not aware of any plans to support deployment of Adobe Acrobat Pro 9.x. This application is particularly difficult to deploy and manage in an enterprise setting. One can always hope that a future version of AAMEE can package the eventual Adobe Acrobat Pro 10, or even better, that Acrobat 10 is released in Apple package format in the first place! Time will tell.

On another front, Adobe has greatly increased its communication about enterprise deployment topics. The Adobe Installation and Licensing blog has seen increased activity of late, and provides links to documentation and solutions for deployment.

http://blogs.adobe.com/oobe/

Adobe's Enterprise Deployment Page contains useful documentation and planning worksheets:
http://www.adobe.com/devnet/creativesuite/enterprisedeployment.html

Even more useful, Adobe has a blog listing every CS5 update:
http://blogs.adobe.com/csupdates/

Complete with RSS and Atom feeds, this blog makes it very simple to keep track of every CS5 update.

Conclusion

While still suffering from some non-trivial issues, the Adobe Application Manager, Enterprise Edition has certainly improved from its initial public release in early June 2010. With some care, it is now very possible to use AAMEE and your favorite deployment software to install Adobe CS5 products in an enterprise environment. Along with the current and planned AAMEE improvements, Adobe has also improved its level of communication on enterprise deployment topics. Adobe is making slow but sure progress on a topic that has long bedeviled enterprise administrators.

MT

About The Author

Greg Neagle is a member of the steering committee of the Mac OS X Enterprise Project (macenterprise.org) and is a senior systems engineer at a large animation studio. Greg has been working with the Mac since 1984, and with OS X since its release. He can be reached at gregneagle@mac.com.

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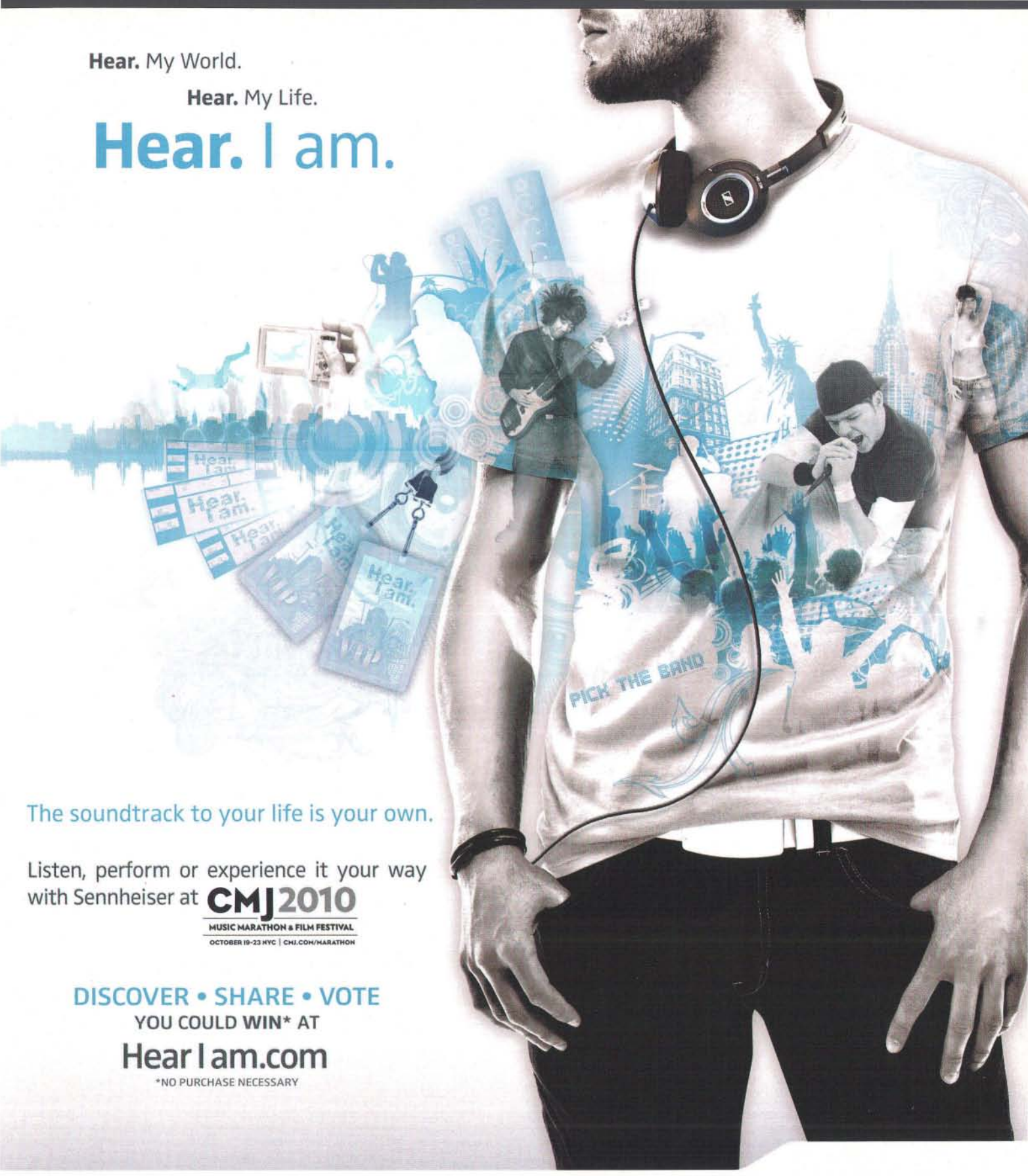
Hear. I am.



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Your Own Software Consultancy Business: Starting Thoughts

Things to think about before going out on your own

by Ryan Wilcox

Introduction

This is the first article in a series, where I give my advice on starting a software development consultancy business. I've spent the last 7 years working as a consultant with my own business (Wilcox Development Solutions - http://www.wilcoxd.com), working on a variety of projects. I've lasted this long, worked on some really fun projects (both on the Mac and on the web), and know not of corporate politics. I'm my own boss, and (I guess) I'm living the dream.

I've also almost gone out of business on three separate occasions. Three times I've ran out of money, clients willing to pay me, incoming invoices, and had a "if you're in a hole, stop digging" moment forced on me. In each case I've had to rebuild my business from the bottom up. I'm still in business today, through luck or grace.

The last almost-failure, in mid 2009, I resolved to think about creating a successful business so I could strive for those goals, and learn something from the experience. The result? A series of articles on starting and maintaining your own consultancy business, just like I did, avoiding the major traps that caught me.

First, I feel as if a disclaimer is required here: This is all my own, personal advice from my experience starting up my business. I did some of these things, and wish I would have done others. Some of these things might be full of hot air, and some of them might not apply to your situation. You can lose everything, financially, with a consulting business. Again, I've come close on at least three occasions. It's your money and your risk; your situations will be different from mine. I do hope that my advice, and your own analysis and business skill, will help you avoid the things I did while you follow your dreams, but there are no guarantees.

Second, to get our terms out of the way, when I say "software development consultancy" I mean working with clients to help them and provide them with solutions while charging them an hourly rate. I'm not going to focus much on startups, who have an idea, develop and sell that idea directly to consumers, because I don't have any experience there. Michael Göbel and Oliver Pospisil have an excellent series of articles in previous issues of *MacTech* on that topic.

Bear in mind that this whole series is full of my own thoughts on running a consultancy business. I would very much love to hear your thoughts on the matter: agree, disagree, think I'm nuts, think I left something out, or want to call a point of mine nonsense? Please email me, and I may incorporate them into the next article.

I've named this series Consultant Cowboy partially as a tribute to the anime series Cowboy Bebop. This series follows a band of bounty hunters (or, in the show's slang, "cowboys") roving the solar system on a quest for bounties. The characters have see-sawing fortunes, just like software development consultancies have. The projects could be big, could be small, but it's a project (and potential for profit).

The life of a consultant might seem romantic, if you're looking at your job at BigCorp Inc, or maybe getting right out of school (it certainly looked that way to me).

A bit of fair warning here: A life of a consultant, like the life of a cowboy (of the fictional spaceship variety or the genuine horse riding variety) isn't for everyone. We'll get into that in a future article too.

This first article will focus on things that you should consider even before you spin up your consultancy. I have 10 pieces of advice: consider them TO DO items, or validation points.

Also, while I ran out of space in this article, next month's article will have some more starting thoughts, and will also raise some serious questions about if the consultancy life will jive with your lifestyle.

Out of 10 pieces of advice I'm about to give you, I had the sense to know (or stumble into) about half when I was starting my business. The other ones were painfully gained over the course of seven years. I've divided this advice into 5 "Essential" and 5 "Conjecture" items. The Essential items are points about your business you should really put some thought into, and listen to my advice here. The Conjecture items are points you could think of as my opinion, based on my experience. Think about these Conjecture points, and if you disagree I hope they can provide kindling to your thought process.

Advice for starting your business

Essential Item One: Have clients (and basic financial base!) lined up before you make the jump full time

Starting a business is hard enough without rushing around trying to find clients. At the start I would suggest having enough work lined up so you can cover basic monthly expenses for a few months. For example, an ongoing client who wants 10-20 hours a week of work, or a few small (1-2 month) projects in the queue.

When I started out my business, I had an ongoing client who wanted 10-20 hours of work a week. This gave me a financial base.

I'll speak more on pricing, in future articles, but my pricing formula at the planning point is this: (minimal monthly expenses) + (30% for taxes) = required income. Just starting off your minimal monthly expenses should include things like a cheap (and/or shared) apartment, groceries, and utilities. Yes, Spartan. Start by drawing out a budget, then figure out how to cut 25% out of that number, and that's your minimal monthly expenses. Next, figure out how to cut 10-15% out of that minimal monthly expenses number. When the lean times come (and they will) having a plan for what to cut will help you avoid angst. That extra 10-15% might be how you pay rent one month, when an invoice doesn't come in.

So, to get the hourly rate you should be charging, take your minimum monthly income and divide it by 80 (4 weeks of work at 20 hours per week). This sounds really low ("half a week of work??!!"), but better to assume low, especially when you're starting up. (Additionally, 20 hours per week also builds in time for work days you don't get any work done at all, because you're between clients, you're running errands and dealing with business stuff all day, or you're sick on the couch with the flu. There's also work you need to do to grow the business, and we'll get into that also in this article.)

Disclaimer time: my business is based in rural Pennsylvania, where living expenses are really low, so I was able to do this math and still get a good (maybe even too cheap!) starting rate. A quick sanity/rate check with that number would certainly be in order. (I suggest Googling "average hourly rates software engineers", as a starting place). You could be really low, you could be really high. Hint: neither of these extremes are very good. Granted, this rate also depends on your experience (fresh out of college vs fresh out of 10 years as an engineer working for Apple Inc).

Average hourly rate pricing depends so much on where you live, your cost of living, how long much experience you have, and sometimes even in what programming languages you work in. Certainly spending some time in research, online or talking to consultant friends, will give you a good gut-check.

The hourly rate you compute here is a ballpark guess, which you can use to estimate if you can pay rent, or if you have to rethink your strategy. Later in this series we'll talk about pricing, and we'll solidify these numbers some more, expand on "what if" scenarios, and try to get a better handle on what this number should be.

Essential Item Two: Accounting / Financial Setup

I speak from experience here: setting up a separate bank account for your business makes accounting and tax time so much easier.

Also, keeping your books for a business is different from balancing your checkbook: you should follow generally accepted accounting practices like double-entry accounting, etc.

I was lucky on this one: I majored in Management Information Systems in college: half business related classes and half "here's a rough overview of Microsoft related technology so you can try and talk with techies about stuff Management wants". As part of this, I had two courses in Accounting, so I was able to build that and do that myself.

My suggestion would be to look for an experienced bookkeeper. At the end of the month simply mail bank statements, receipts and invoices to them and let them enter it into QuickBooks.

Certainly you can do this work yourself: get a good book on basic accounting principles (maybe browse your local college bookstore and get what they use in Accounting 101). Reading this book should make bookkeeping software, like QuickBooks, make more sense.

Last year I switched from doing the books myself to using a bookkeeper. I realized that my bookeeper's hourly rate is less then the hourly rate I bill my clients, so if I did work for my clients while my bookeeper worked for me, I'd come out having turned a profit! Better yet, the bookeeper processed my records faster than I would have!

Think about it this way: in your area of expertise, have you ever seen an amateur trying to do what you do? Crappy code that took three times longer to write than if you had done it? With a good bookkeeper, the tables have turned: you're now the amateur.

Don't let the word "amateur" dissuade you from learning about accounting, or tax code. It's like when you first started to program: you might find satisfaction in digging into basic accounting principals, understanding subsection and

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paragraphs of sections of the tax code. Maybe you just want to understand an accounting concept yourself before trusting someone else's word for it. Great!

Back to more mundane topics, in addition to a checking account for the business, you'll want a separate account where you set aside money each month for quarterly taxes. Ideally this should be an account that is both safe and makes you money (perhaps a money market account, or a checking account with a good interest rate). Ideally the money you're saving for the government should be able to make you some money too!

You'll also want to create a savings account for your business: put profits here, savings for bad times, etc.

Conjecture Item One: Seed Money

This whole "starting a consultancy business" thing is a whole lot easier if you have money saved up. (I'd recommend 4-6 months of expenses.) This money will help you through the rough times (and they will come), help you buy machines and other assets when you need them, or help you grow your business.

I had about 9 months of money saved up when I started my business (Money willed to me from my Great-Grandmother). After about a year I decided to do two things with that money: buy a new PowerMac G5, and hire my first employee (telling him that I had salary for 6 months of his work, and any longer would depend on incoming projects).

The tale ends sadly: the money finally ran out about 18 months later, and I had to lay my first employee off. I consider this experience both a success (the money lasted three times longer than I had initially projected), and a failure (I had to lay my employee off, and I have yet to save that kind of money back up again.) But that seed money came in useful during a busy time in the life of the business.

Essential Item Three: Don't bet the farm!

Go 3-4 months before betting the farm (or your house, your life's savings, or your seed money). The first 3-4 months starting up will be full of unpaid work: setting up your website, getting your toolset in order, networking, finding clients etc. Ideally you'd want to do this without the pressure of also having to make rent every month. You might want to do all this before you quit your day job, for example.

You should be this cautious even if you do have seed money: you've saved up all this money, you don't want to blow it all then be back looking for a normal job, right? If the business works out, we'll need that seed money for later. If the business doesn't work out, we want to have lost as little money as possible.

If, after 3-4 months, if you're making good money (or have clients that want more of your time), then evaluate and make an informed financial decision, projecting the success (or failure) of the last 3-4 months out.

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Essential Item Four: Know your competition

It's a good idea, for any business, is to do a quick scan of the local area to see if other people in your area are doing what you're doing. For example, if you're doing web design: what companies in your area are doing this kind of development?

Initially, you'll want to limit your search to local businesses just to avoid going crazy. Yes, you have competition in India, or Russia, or across the country, but looking locally first is a good microcosm of what you'll see in the wider world.

If there are an abundance of developers in your area doing exactly what you're doing, you probably need to start thinking about the following options:

- Find a way to differentiate yourself. For example, maybe everybody else does ASP.NET, and you do Ruby on Rails web development work. While you both do web work, you use different tools: this is how you're differentiated.
- Get worried, For example, everyone else does web design, and so do you. Some extra thought is required before getting into a - possibly saturated - marketplace.
- Start forming alliances (everyone, after a certain size, needs a subcontractor now and again because things get busy)

Sometimes a great vector of finding contracts is just to pound the local pavement: hit up Craigslist, local contacts, friends, and local networking opportunities like meetup.com meet-ups and user groups. Ten web design shops in the area means you're going to have to fend off the competition...

Conjecture Item Two: Identify Your Competitive Advantage

If you've gone through the exercise above, and found some other development shops doing exactly what you want to do, now you need a reason why a potential client should hire you over the other guy.

To deal with this, you need to identify you competitive advantage. Are you an expert in a rapid development technology (even an obscure one), and can get high quality websites out faster than "other guys"? Speak Managementese? Live in an area where cost of living is low? Have good timezone placement with regards to where your customers are? Maybe you just live in an area with lots of opportunities, like a big city.

Maybe you have an area of expertise you can leverage as an advantage: "talk to me when you're ready to take your Ruby on Rails website to mobile platforms." In that case, you have a competitive advantage.

This whole exercise of scoping out the local competition and identifying your competitive advantage - how you are different from those guys - feels small and quaint, given the opportunities presented by the Internet. From my office in PA I've worked with clients in California on a number of different projects. I've also worked on a team distributed across the United States, with half the team working from Brazil. However, if you can't explain to the customer why they should hire you instead of the C++ shop down the road, how can you hope to compete against the C++ shop in India?

You will certainly compete with people from other countries. I peruse job sites like Craigslist, Guru.com, and rentacoder.com, and I've found several regular clients from those sites. Certainly I can't compete with companies from India on price, but I can compete on other things (expertise, and being on the East Coast avoids timezone troubles. Speaking from experience, it's difficult to manage people 12 timezones away... I did it for a month once).

Also know that if you're a PHP coder, and there are already 5 PHP shops in your area, there's bound to be 2000 PHP shops around the world. You have to ask yourself: why would a client pick you?

Conjecture Item Three: Have, or find, an area of expertise

Why would a client want to hire you? This is easier if you have an area of expertise.

Certainly this isn't a deal-breaking item if you don't have any real expertise. Maybe you're right out of college, or want to break into iPhone development from Java, so you don't really have a lot of expertise already in your "target" platform. But there's good news:

You don't have to be an "expert in all things Cocoa", as this would take years. (If you are, then awesome - skip to the next section of this article).

You could be an expert in a very small field (for example, I'm an expert in automating data import and export in the (obscure) Helix relational database - http://www.qsatoolworks.com - simply because I had technical knowledge and I dug into it.

Or maybe you're an expert in hooking applications up to hardware devices.

Create and dig into areas that you care about. Maybe it's "iPhone apps that communicate with websites to synchronize data", or maybe "Mobile websites in Ruby on Rails". For example, I've seen people (Brandon Walkin - http://www.brandonwalkin.com) who I would consider an expert on building Interface Builder Plugins for Cocoa, given his work on BWToolkit.

Certainly you will be doing work outside of your area of expertise, but it helps if people want to hire you, specifically, to work for them. Some of the best projects I've worked on have been when clients come to me, saying, "I hear you're an expert in this area, and I need...". The best lead is a lead you don't have to chase.

Conjecture Item Four: Plug into the community

A great resource, both for learning, gaining a reputation, and getting questions answered is the community. For example, the Mac Small Business mailing list

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(http://groups.yahoo.com/group/macsb) is a great resource for both Cocoa consultants and independent developers that create their own products.

On the technical side, there is sure to be a mailing list, forum, or tag on stackoverflow.com for your technology. Or start a weblog to write your thoughts down, maybe write a tutorial or walkthrough or two.

As a consultant, sometimes you're under NDA about the various projects you're on, or just can't show it because it's back-office stuff, or a small part of a larger project. Being active in the community is a way to point to and show what you know to potential clients.

This is also another way you can show, or start and increase, your area of expertise. For example, writing a lot of weblog entries on creating mobile apps on Ruby on Rails proves your salt more than just you saying "Oh, I'm an expert".

Plugging into the community requires giving freely: spending an hour here and there putting together a sample for someone, puzzling through source code for the missing logic, writing up a new technique you've discovered, or working with an open source community to get a changes, or patches, accepted into their code repository.

Early in my consultancy career I was an active member of the wxWidgets (wxwidgets.org) mailing list and community. One of my clients was developing in wxWidgets, so I spent a lot of time submitting patches back to the community and working on getting them accepted. I also was active on the mailing list, helping people develop wxWidgets applications on the Mac.

A few years later I realized that I was spending a lot of my time on mailing lists and news, and that I should cut back a little bit so that a higher percentage of my time was actual billable time.

Now the Ruby on Rails framework pays the bills, but nobody in that community knows me: I'm not on the mailing list, I don't post many blog entries about Rails. I'm a stranger in the Ruby on Rails community. I probably should pour some time into the community, to give back, and to increase my own level of expertise and to start building my reputation.

It's also value for value: if you make your living on Ruby on Rails, or another open source framework, you should give some value back to the community that gave you a valuable tool.

Essential Item Five: A Website (made by you!) for your business

So, this is almost critical: design and implement your own website. Even if you're not getting into anything related to website development, probably someone will ask you "can you do a website for me?"

If you are getting into website development, consider this site the first entry in your portfolio. Doing contract work I've found it hard to create a portfolio: very often I'll be under NDA, the work will all be back end stuff, or "only people in the organization have logins". A website that looks good can be something you point clients to.

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Also, you'll probably need to update your website every so often, with the latest web technologies or looks. For example, earlier this year I moved my website to the Webby website generation tool (http://webby.rubyforge.org), after not touching the look or layout for 7 years. My website now looks so much better!

Conjecture Five: What do you identify as a success?

The third time the business failed I was pretty down about it. I had no money, was engaged to be married, and I had no money to pay my two part-time workers. I spent about two months saying that the business was a failure, and it seemed like every time I was asked: "why do you think that?"

I finally got fed up and make two lists, one of which is applicable now: **A Criteria For Success Lis**t. This list defined 7 goals that I wanted for myself, and (if I obtained all of them), then I would consider myself a success.

Making this list did two things:

1) It gave me something concrete to shoot for: maybe there's something I can change to turn a failing area into a success.

2) It gave me goals for the future.

To give you an example, I'll share my list

* 6 months average income in the bank (Long Term)
* Ability to consistently write paychecks for myself (Short Term)
* Should not have to "catch up" on previous quarter's taxes. (Short Term)
* Focus on: good people, good relationships, and good work (Long Lerm)
* Bringing home $XX / hour after taxes, savings, and counting my non-billable time spent working on the business, billing, and writing. (Short Term).

Giving the number here would distract from the purpose - again, I live in a rural, very low cost of living, area of the country. The number is enough keep a roof over our heads, feed us, pay off some debts, with some left over to save. The number is above average income for the area, yes, but not that much above average.

* Ability to travel, one month out of the year, abroad (Long Term)
* Ability to catch up (on taxes, savings, checking etc) when bad times have passed. (Short Term)

I've achieved 4 out of the 7 items. The other 3 I'm working on. Maybe I'll never obtain some of them, but they're things to work towards.

Of particular importance on this list is the "Bringing home $XX per hour" one. This number will vary depending on where you are, but here's where an economic decision comes in: even if you're able to pay rent, etc, are you making more than minimum wage? Better yet, are you making more money than you would be as a regular employee, when you factor in all the extra stuff (and worries) you have with the consulting business?

You need to make this list for yourself, then figure out ways to achieve those points. For example, I was able to

achieve the "Bringing home $XX per hour" by monitoring my hours per week, and income per week, and making sure it's about that certain amount.

One tip for building this list is to think about what you want short term, and what you want long term. "Ability to consistently write paychecks" is a good short-term goal. A long-term goal would be "Ability to travel, one month out of the year, abroad." Long term because if I can't consistently make payroll, there will be no money for traveling!

An awesome example of a Criteria For Success list in Avdi Grimm's recent weblog entry on Wealthy Freelancer Worksheet: http://journal.avdi.org/the-wealthy-freelancer-worksheet. Avdi is (publicly) filling out a worksheet from the book *The Wealthy Freelancer: 12 Secrets to a Great Income and an Enviable Lifestyle*, but it also is also an excellent example of a success list.

It's important to note that Avdi is a giant in the Ruby on Rails community: every Ruby or Ruby on Rails project uses at least one thing he wrote. So in one way, some of his goals are possible only through his experience and reputation in the community. Some of these are just common and good goals (you really should see your family, for example).

Conclusion

Of 10 pieces of advice laid out in this article, many of them are straight from the school-of-hard-knocks. There's a lot of ground to cover in this Cowboy Consultant series: so much I want to share, so you can avoid some of the mistakes I made. Again, I'd very much like feedback: rwilcox@wilcoxd.com, if you have comments or thoughts. This is important stuff, and I consider it a responsibility to help people get this right.

Next month will be more starting thoughts. Not everyone is cut out to be an independent contractor, and next month's article will talk about that. All this talk about setting your goals sounds awesome (who doesn't want to take a month off to explore Paris? Or work out of Rio for 3 months?), but there's a lot of sacrifice that has to come first (especially in the early years), and hard work (or clever business dealing!) to get there. It's certainly prudent here to come down off any potential high, put this article away and take it out again when next month's article comes out.

Thanks go to Jared Bared, David Bock, Matthew Strange and Nan Wilcox for reviewing this article.

About The Author

Ryan Wilcox has been consulting on his own for the last 8 years, through ups and downs in his business. In 2009 he started thinking about best practices for business, in addition to his normal thinking about programming. He can be found at: http://www.wilcoxd.com. Have thoughts or want to give feedback on this article? rwilcox@wilcoxd.com

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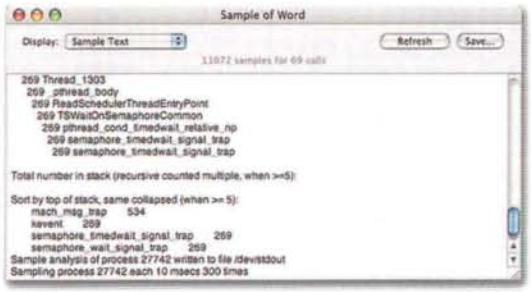

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by Boisy G. Pitre

What's Your Style?

A look at coding style and formatting in Objective-C

Hello, and welcome to MacTech's newest column, Developer to Developer. In this series, we will delve into a range of programming topics that are of interest to Mac OS X and iOS developers alike. I welcome your to email me ideas as we explore the growing ecosystem of Apple's technologies together.

Introduction

Are you the type of developer that knows beautiful code when you see it? Do you, upon editing someone else's source, have to resist the urge to perform a total reformat of the indentation style to your standards and liking? Does coding style matter to you so much that you adhere to it with the intensity and fervor of a zealot? For many of us, the answer to these questions is a resounding yes. There is something about style that matters, even when we are working with something that is technical in nature (that's why we use the Mac, right?). Many would agree that little else brings out the passions and opinions of software developers quite like the topic of individual coding styles and source code formatting. It just goes to show how important the topic really is to us.

The rote process of developing software and writing code compels us to form our own personal coding styles and patterns over time. We may pick up hints here and there to modify and improve upon our style somewhat, but for the most part, there is a consistency that guides our coding practices throughout our careers. In fact, coding styles can become so personal and unique that they take on the significance of a "fingerprint" of sorts. This is all too familiar when working as a developer on a group project; it becomes easy to identify who wrote a particular segment of code just by looking at how it is written and styled.

For this month's *Developer to Developer*, I thought it would be interesting to wade a bit into this fairly charged topic and share some thoughts and views on coding style, both for C code in general as well as Objective-C. Much has been written on coding styles for an abundance of programming languages throughout the years, with reams of information easily searchable on the Internet, so I won't attempt to rehash the many articles and sources here. Instead, I want to share with you some style truisms that have guided me to choose my particular coding style, while encouraging you to explore further to see how your coding style can possibly benefit.

The Three C's of Coding Style

In my experience, there is not one correct or perfect way to format your source; differing styles have their own merits. However, I believe that any good coding style will share three guiding principles that I call the "three C's":

Clarity – A coding style should enhance the readability and understanding of the source and give the reader the best possible presentation. Clear code can bestow upon the reader a sense of prose and flow that is easy to follow.

Convenience – The style should make the task of writing, modifying, and refactoring one's code easier.

Consistency – Use of a particular coding style should encourage consistency throughout the code base. Usually, this is enforced through coding standards or guidelines that are adopted among companies and projects. In many ways, consistency is the foundation of these three C's: it is imperative for clarity and facilitates convenience.

Now, let's take a look at some specific areas where coding styles vary and how these three C's can be applied.

Function and Method Declarations and Definitions

There are a number of ways to format method declarations in Objective-C, as well as statements that call these methods. In my experience, this is probably one of the most varied areas of coding style. Let's start by looking at an example Objective-C method:

```
- (NSString *)tellAJoke:(NSString *)myFunnyStory
punchLine:(NSString *)makeEmLaugh;
{
  [speaker speakTheJoke:myFunnyStory
              punchLine:makeEmLaugh
                 volume:loud
                  voice:@"Tom"];
}
```

There are several things to note about this method.

First, the spacing is deliberate in the method signature. The first character in the column is the '-', followed by a space, then followed by the return value type. Any additional spaces in the first line are between named parameters. There are many variations of spacing that can appear here, but I find this style to be used widely by example code from Apple, as well as many open source projects. This particular formatting style promotes *consistency* across many projects, and I always form my method calls this way.

Secondly, notice the format of the call to the `speakTheJoke:punchLine:volume:voice:` method, which takes up several lines. Objective-C's verbose method signatures

make the construction of a multi-line method call the preferred choice for several reasons. It adds *clarity*: the formatting style clearly shows the list of parameters expected in the particular order. It also brings *convenience* by preventing you from spending time using the horizontal scroll bar or arrow keys to search for a parameter outside of the window's bounds, something that can be irritating. Also notice how subsequent parameters are anchored underneath the previous line by the colon character. This is a common way for aligning subsequent named parameters in method definitions, and is supported by Xcode's editor.

Finally, one neat syntactical feature that Objective-C provides (but C and C++ choke on) is the ability for a method definition to contain a trailing semicolon. This looks strange at first, especially to experienced C programmers, but is handy nonetheless. I always add this ending semicolon, since the method's declaration in the interface file will require it anyway. As you modify your method's signature, copying and pasting between the implementation and interface files become a little easier with this convenient addition.

Code Block Formatting

The code block in C and its variants is delineated by the open and closed curly brace characters `{` and `}`. When it comes to statements that precede a code block, such as `if`, `for` and `while`, curly braces are only necessary when encompassing more than one sub-statement. For one line statements, the curly braces can be omitted. This is touted as a language convenience and is used quite often by coders to save a line or two. There are some good reasons, however, to avoid this shortcut. Take, for example, the code fragment below.

```
if (x > 0) x++;
```

Both the `if` statement and its conditional statement are on a single line. Of course, this is perfectly legal syntax, but a quick glance through the code may cause someone to miss the intent. As an improvement, the form below uses a new line and indention to give an immediate hint that there is some dependence between the two lines.

```
if (x > 0)
    x++;
```

Now when glancing, the intent is a little more clear, but without braces to form our block, there is still some visual ambiguity, which could translate to additional problems if we add a line like this:

```
if (x > 0)
    x++;
    NSLog(@"x = %d", x);
```

Does the `NSLog` statement get executed within the bounds of the `if` statement? Experienced C programmers will know instinctively that the line containing `NSLog` rests outside of the influence of the `if` statement and will always be executed. Nonetheless, relying on C's notion of what line is subsumed by an outer statement can be confusing to someone new to the language and its nuances. We can add clarity to the code and be much clearer with a little more effort:

```
if (x > 0) {
    x++;
}
NSLog(@"x = %d", x);
```

This is the best indication yet that the bounds of the `if` statement are intended to encompass the `x++;` statement and not the `NSLog()` function. The addition of the curly braces add clarity, making it immediately known what statements are within the bounds of the `if` statement. Their presence is also a convenience because it allows for easy addition of further statements in the block if needed (which would require braces anyway).

Adding the opening curly brace at the end of the controlling statement line is a very popular style, but I prefer to place each curly brace on its own line:

```
if (x > 0)
{
    x++;
}
NSLog(@"x = %d", x);
```

There are some advantages to formatting code blocks this way:

It aligns the opening and closing braces on the same column. This helps visually when viewing and editing source code.

It makes isolating and debugging code a bit easier. For instance, if you want to have the code in the block always run, you can simply comment out the line with the `if` statement.

Segregating Code within Methods

I am a huge fan of partitioning my code into specific sub-areas within a method, and even go as far as declaring variables at the start of the block if their lifetimes are contained within that block's scope. It is not necessary and may actually seem a bit verbose, but it is a visual reminder that the code is cordoned off and self-contained within the function or method. It also helps in refactoring if I decide later that I want to turn that particular block into a method of its own. For example:

```
- (int)someMethod;
{
    int a = 5;

    // this sub-block performs work with its own variables
    {
        int r = a * 2;

        . . .
    }

    return a;
}
```

The sub-block in the above method is isolated with its own variable declaration section and code. Even if the code in the sub-block references the variable `a` declared at the start of the method, the code can be easily promoted into a method in its own right for reuse elsewhere:

```
// the sub-block has been promoted to a method
- (void)newMethod:(int)a;
{
    int r = a * 2;

    . . .
}
- (int)someMethod;
{
    int a = 5;

    // call the method where the sub-block was
    [self newMethod:a];

    return a;
}
```

Isolating Experimental Code

As the development process proceeds, there will invariably be code that you have invested time in writing, but for one reason or another, want to keep out of the compilation process. Using C's /* * / bounding style comments can isolate code and prevent it from being compiled, but my preferred method is to use `#ifdef/#endif` preprocessor macros to isolate temporary or experimental code:

```
#ifdef EXECUTE_CONDITIONALLY
    while (a > x)
#endif
    {
        x++;
        a-;
    }
```

Note the detailed naming of the macro `EXECUTE_CONDITIONALLY`. It is specifically named so that I can infer the meaning and intent of the conditional's presence. One could simply shut off the code by using `#if 0/#endif` as a wrapper, but using `0` as a conditional fails to convey the reason why the code is isolated. Effusive macro names bring clarity to the code.

This snippet also serves to illustrate my earlier assertion that curly braces on separate lines bring convenience to the code during debugging. Because of the placement of the braces, it is easy to isolate code either for inclusion or exclusion.

Variable Comparisons

One particularly useful trick that I have seen used in C and Objective-C code is reversing the normal order of comparisons in order to catch assignment vs. comparison errors that involve a variable and a constant. It often happens in C and Objective-C, especially to those new to the language, that the assignment operator will be used when the comparison operator was intended. Take the following snippet of code as an example:

```
if (a = 3)
{
    a++;
    }
```

Experienced C programmers will immediately recognize that in all likelihood, the code is intended to compare the variable a to the number 3, and not make an assignment:

```
if (a == 3)
{
    a++;
}
```

Both code snippets will compile, but the run time behavior of the first will likely not be what the developer intended. A great way to work around this potential error is to reverse the constant and the variable being compared:

```
if (3 == a)
{
    a++;
}
```

This may look a bit esoteric at first, but it is perfectly legal. However, the following snippet will result in an error by the compiler:

```
if (3 = a)
{
    a++;
}
```

Since a constant cannot be assigned a value, the compiler flags this code with an error and reports "lvalue required as left operand of assignment." So by simply reversing the position of the values in the comparison, we gain an immediate benefit: the compiler tells us if we are assigning a value to a constant, and we get an error.

Comments & Documentation

We all know how important comments are in our source code, both for remembering what we did and elucidating others who might read it later. Besides the obvious rule of making comments meaningful and detailed, how can we improve the style of commenting our code?

One standard that I have adopted for documenting the classes that I write is HeaderDoc, an open source tool for integrating documentation about methods and functions into quality HTML documents. HeaderDoc is part of the Mac OS X Developer Tools and Apple has great documentation on how to use this feature.

The idea behind HeaderDoc is to integrate information about a method, function, class, or just about any other language entity into a comment that sits above the declaration (usually in the header file). Consider the `tellAJoke:punchLine:` method used in the example above. In the header file where the method is declared, we could use HeaderDoc tags to describe how the function works:

```
/*!
    @method tellAJoke:punchLine:
    @abstract Deliver a comic story to induce raucous laughter!
    @param myFunnyStory The story to tell the audience.
    @param punchLine The ending that is sure to get them going.
    @discussion This method lets your Mac tell a joke. @result
A string containing the audience's response.
 */
- (NSString *)tellAJoke:(NSString *)myFunnyStory
punchLine:(NSString *)makeEmLaugh;
```

All HeaderDoc comments begin with /* ! and tags start on a new line with an @ prepended. The HeaderDoc system has a rich set of tags that can accommodate jut about every aspect of

Objective-C as well as other languages; we've used just a few of them here.

When you're ready to convert your HeaderDoc comments into an HTML page, simply run this command from Terminal:

```
headerdoc2html -o . MyHeader.h
```

Once the command has completed, all of the documented methods in your header file will appear in an HTML file in the same folder. Voila, instant documentation! Of course, it is possible to customize the appearance of the HTML to your liking, and there are tons more features to explore. I highly recommend Apple's documentation on HeaderDoc, which can be found in Xcode Help, or on Apple's developer site. Start using it, and it will change the way you document your code.

Summary

Coding style and formatting is an extensive topic, and we've only scratched the surface; perhaps you'll find some motivation to explore the topic in a bit more detail. Keep in mind that there are enough possible variations to still maintain your unique style and adhere to the themes of consistency, clarity and convenience in your code. No matter how set you may be in your particular style, I encourage you to continue to look for ways to enhance your coding skills in this arena. Until next time, write great code!

Bibliography and References

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Wikipedia. *Programming Styles*, *http://en.wikipedia.org/wiki/Programming_style*

About The Author

Boisy G. Pitre lives in Southwest Louisiana and is the lead developer at Tee-Boy where he also consults on Mac and iOS projects with a variety of clients. He holds a Master of Science in Computer Science from the University of Louisiana at Lafayette. Besides Mac programming, his hobbies and interests include retro-computing, ham radio, vending machine and arcade game restoration, and playing Cajun music. You can reach him at boisy@tee-boy.com.

Installing Joomla! on a Mac

by Mihalis Tsoukalos

Introduction

This article will present Joomla!, a Content Management System (CMS) that works with many platforms including Mac OS X. It will also show you how to install Joomla! on your Mac without troubles.

What is Joomla!?

Joomla! is a CMS that allows the creation of powerful web sites and online applications. Joomla! is open source and can be easily extended.

A CMS accepts content such as text, photos, music, documents, video, etc. The most important advantage of a CMS is the fact that it does not require any technical or programming skills in order to either administer or use it. Also, the CMS itself manages its contents so that you do not need to. Generally speaking, in a CMS, content is stored in the RDBMS (a database) instead of HTML files.

Joomla! is based on both PHP and the MySQL database so you'll need to have both of them installed and running before trying to install Joomla! on your Mac.

Getting Joomla!

The current stable Joomla! version is 1.5 although version 1.6 is near official release.

By going to the Joomla! site, you can download the latest stable version of Joomla! as a zip file. For this article, I am using the Joomla_1.5.18-Stable-Full_Package.zip file.

The file size of the Joomla_1.5.18-Stable-Full_Package.zip is around 7Mb.

Installing Joomla!

Installing Joomla! is the biggest part of this article and is also the toughest part of the Joomla! experience. You should carefully follow the presented steps and, in case that you have any problems, you should carefully look at the relevant log files (*tail -f /var/log/apache2/error_log* is a good starting point) for potential error messages that will help you solve any problems.

For this article, I am using Snow Leopard 10.6.4, the PHP version that comes with Snow Leopard 10.6.4 and MySQL5 Ver 14.14 Distrib 5.1.48 (installed via MacPorts).

Once the prerequisites are met (having installed MySQL), the required steps for installing Joomla! on your Mac are the following:

First you should unzip the Joomla package (*Joomla_1.5.18-Stable-Full_Package.zip* in this case) that you downloaded inside the *Sites* directory that resides inside your *home* directory. For this article, the unzipped directory has the name *Joomla*.

Then you should execute the following command from the Terminal application while being on the *Sites* directory:

```
chmod 755 Joomla
```

so that the *Joomla* directory is readable from the apache process (the web server process). You, of course, also need a running Web server in order to install Joomla!. (Mac OS X ships with the Apache web server. In Mac OS X, use the Sharing Preference Pane to enable "Web Sharing". Mac OS X Server administrators should use Server Admin to enable the web service).

Then run Safari (or any other web browser) and type the following address:
http://127.0.0.1/~mtsouk/joomla/

Of course you should replace the *~mtsouk* part with your username ☺.

If everything is right, you should see a browser window similar to Figure 1.

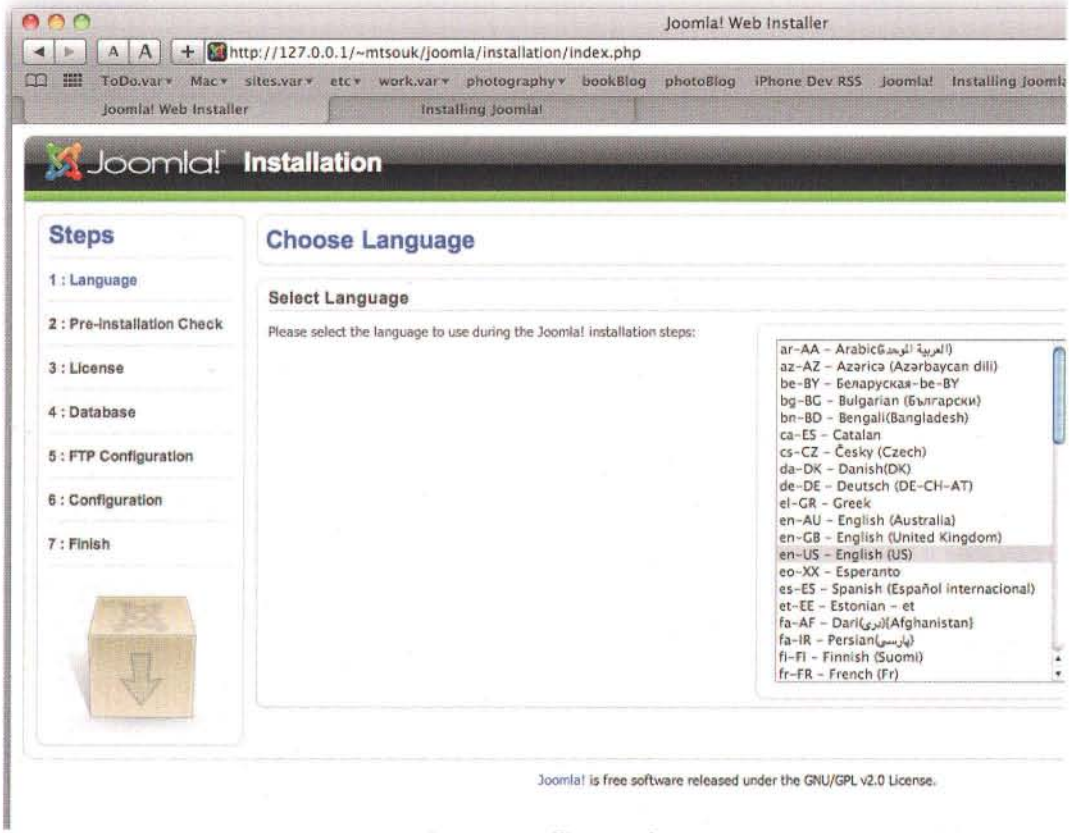


Figure 1: Installing Joomla!

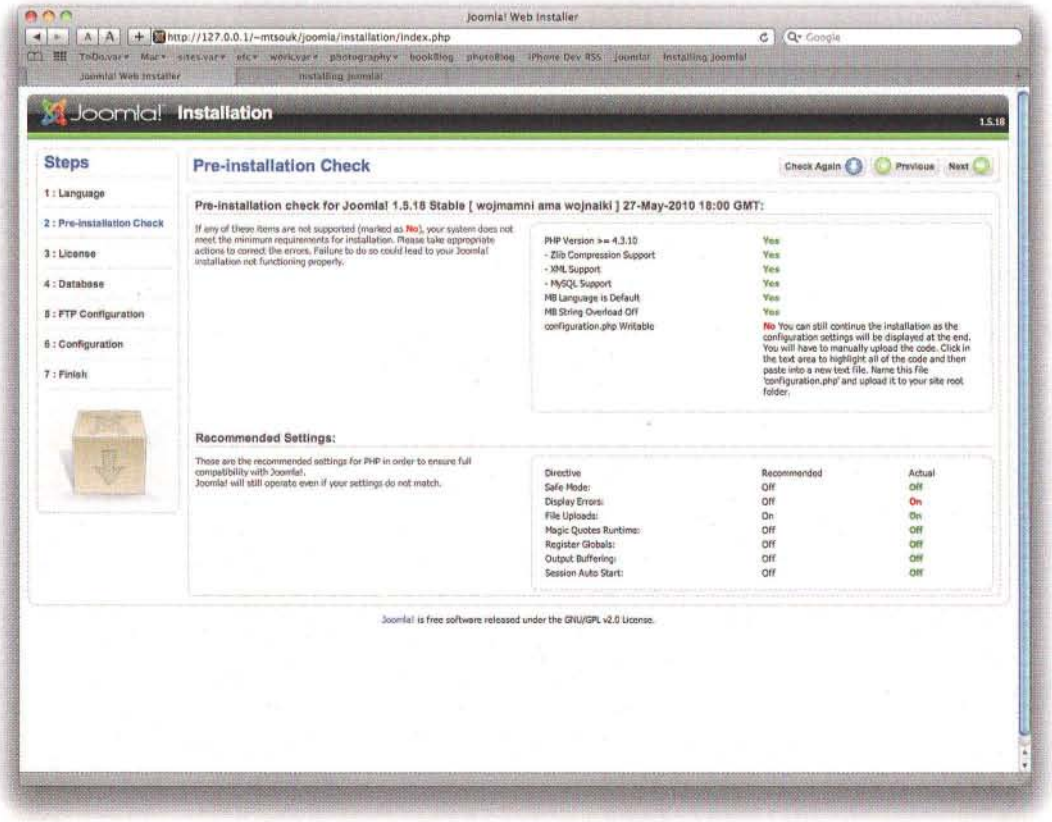


Figure 2: Step 2 of the installation process

This step is very easy as you just have to select your preferred installation language and press the Next button on the upper right corner of the Safari window. After pressing the Next button you will see an image similar to Figure 2.

Just press Next again and you will see Figure 3.

After reading the Joomla! license, press the Next button you will go from Figure 3 to Figure 4 which is the first screen in the Joomla! installation that you will have to actually type real data.

This time, you cannot just press Next and continue. You will now have to correctly type the required information in order to continue. First, let me tell you some MySQL-related information: every MySQL installation has a database called *test* (that can be used in the *Database Name* field shown in Figure 4). In order to avoid turning this article into a MySQL crash course, I will use the *test* MySQL database but if you are going to actually use Joomla!, you or your MySQL administrator should create a different database **dedicated** to Joomla!. Again, you should ask your MySQL administrator to give you the Username and Password data. So, after filling the required information, you will be presented with something similar to Figure 5. If something goes wrong with your MySQL related data, you will see an image similar to Figure 6. You

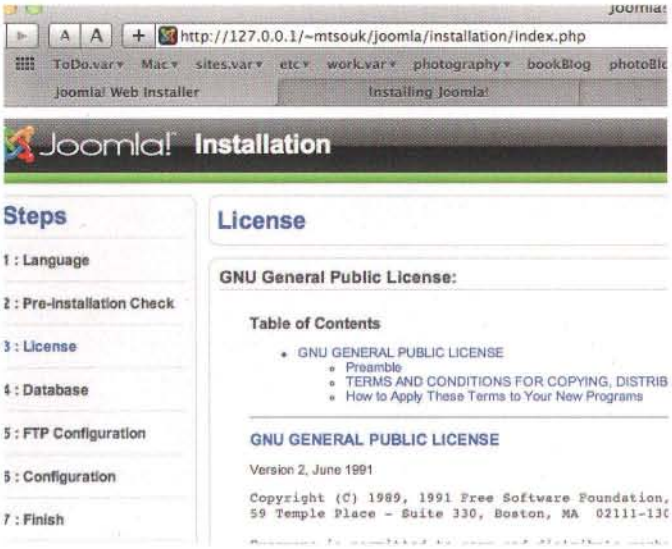


Figure 3: The Joomla! License

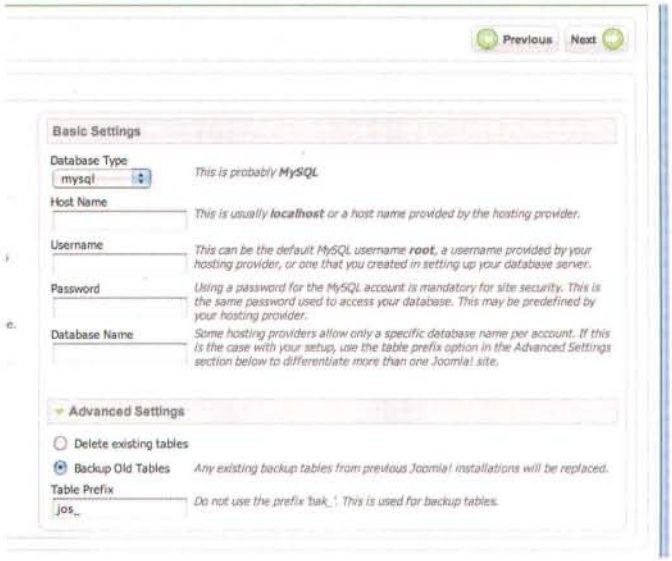


Figure 4: The Joomla! Database configuration

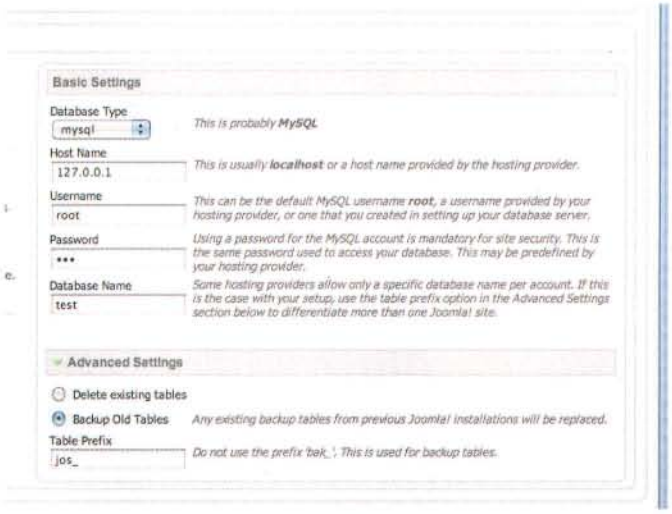


Figure 5: Completing the Joomla! Database configuration

should use the more specific *127.0.0.1* as the hostname and not *localhost*.

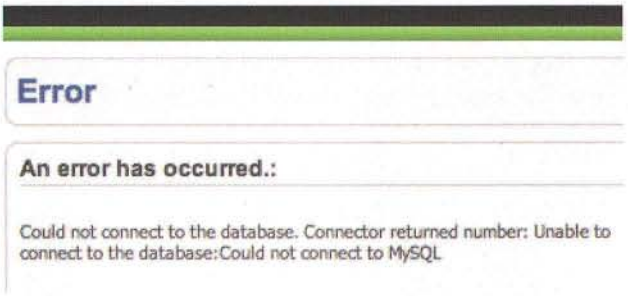


Figure 6: Problem with the MySQL configuration

After successfully completing the MySQL configuration, you will see Figure 7 which is the FTP configuration. Do you want an FTP configuration? I do not, so I just pressed Next and went to Figure 8! Ideally, the FTP layer of Joomla! should be not needed at all. The reason of having it is that some WWW servers do not create files using the correct file owner and/or file permissions. What the Joomla! FTP layer does is to create the files "temporarily" and then ftp them to the server using the correct file owner and/or file permissions. This may look complicated but it is a great solution if you need it.

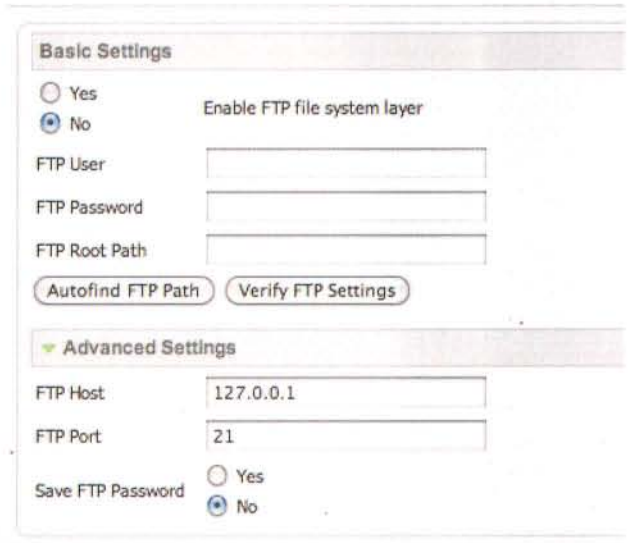


Figure 7: The Joomla! FTP Configuration

I added the required information and chose to Install Sample Data. The current Safari window can be seen in Figure 9.

After pressing the Next button you will see Figure 10.

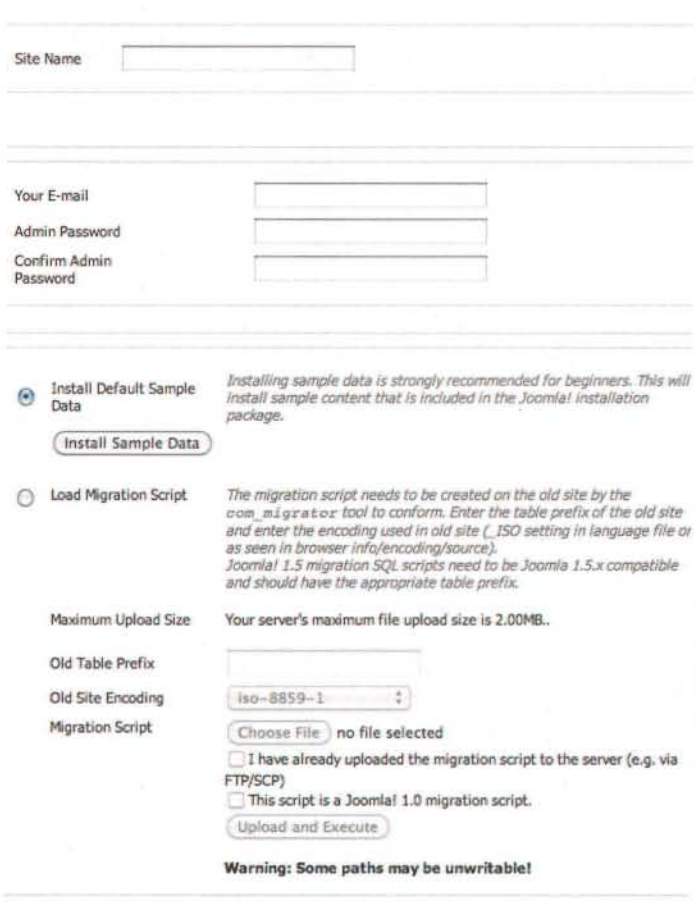


Figure 8: The Main Configuration screen of Joomla! installation

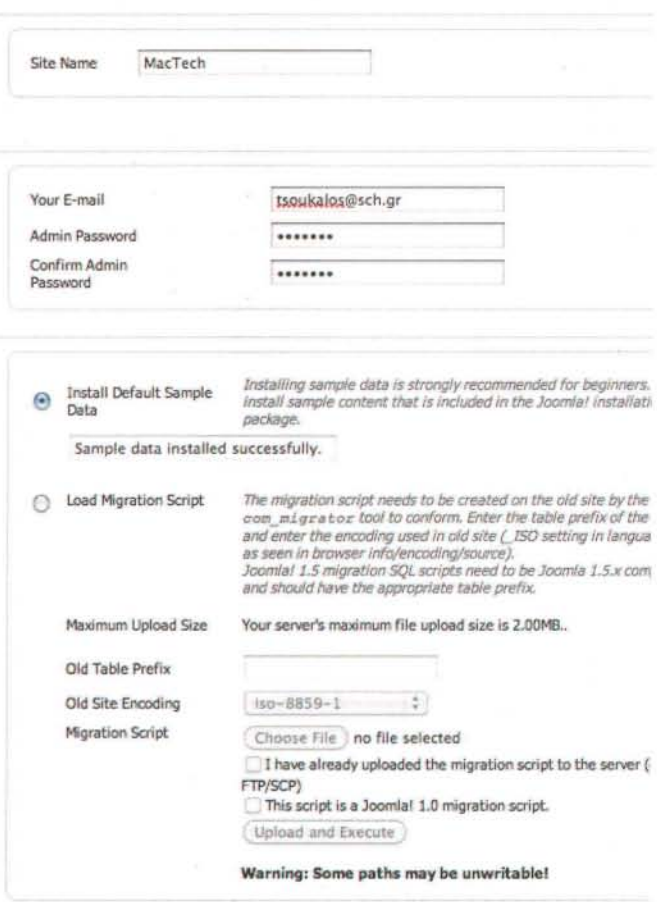


Figure 9: Completing the Main Configuration page

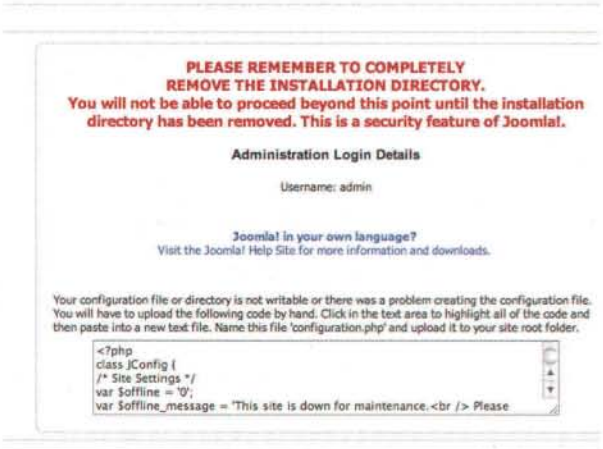


Figure 10: Almost done!

As you can see in Figure 10 after reading the red colored text, you should now go to the Joomla directory and **remove** the *Installation* directory. Tip: instead of removing the directory you can just rename it but this may be a security risk. Also, as you read, you should now manually have to create a file named **configuration.php**. In order to create the configuration.php file you should first click inside the text area and copy the text. Next you should open your favorite text editor, paste the text and save the file named configuration.php inside your *Joomla* directory (inside the *Sites* directory). My configuration.php file permissions are as follows:

```
-rw-r--r-- 1 mtsouk staff 1798 Jul 12 08:43
configuration.php
```

Now you are ready to actually use Joomla!. Press the Site button and you will see Figure 11. You may notice that there are many error messages related to the timezone. Those errors are PHP-related and can be corrected by modifying the PHP configuration file. I will tell you how to fix it in the next step but, again, if you are not feeling comfortable doing it, seek advice from your system administrator.

So, in order to correct the error messages you should edit the */etc/php.ini* file. If the file is not already there, you should create it. Please notice that there is already a file called */etc/php.ini.default* that you can use. It is common to simply copy *php.ini.default* to *php.ini* and then edit the new *php.ini* file. I copied the commented *date.timezone* line,

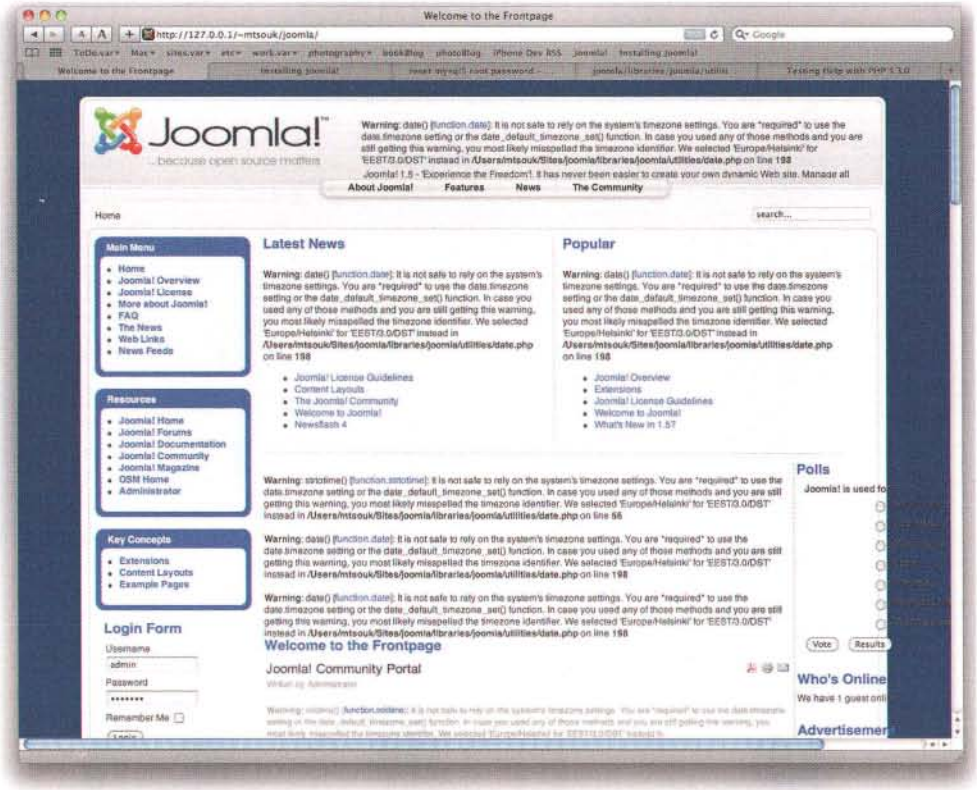


Figure 11: Your Joomla! Site!

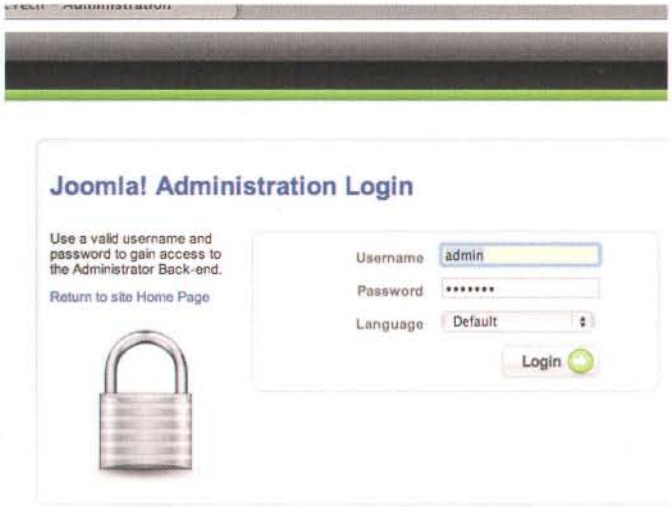


Figure 12: Joomla! Administration Login

uncommented it and added the *"Europe/Athens"* text. This can be seen in the following lines:

```
; http://php.net/date.timezone
;date.timezone =
date.timezone = "Europe/Athens"
```

Save this file, restart the Apache web server and reload the Joomla! Page. You'll see an error-free Joomla! front page.

You are done! You now have a fully working Joomla! site! It's not that difficult following these instructions ☺.

Administering Joomla

As this article is mainly about installing Joomla! on a Mac, I am only going to give you some tips about Joomla! administration.

The first thing to know is that by going to the following URL, you will see the administration login screen (Figure 12):

http://127.0.0.1/~mtsouk/joomla/administrator/

(Note that the *~mtsouk* part will be different for you! Substitute your own user id).After a successful login, you will see Figure 13, which is the Main Administration page (a.k.a. Control Panel).

There are three types of Joomla! administration tasks: *presentation* administration, *content* administration and *system* administration.

As far as system administration is concerned, there are eight managers that support system administration tasks (some of them can be seen in Figure 13): Global Configuration Manager, User Manager, Menu Manager, Extension Manager (you can access it from the *Extensions* menu), Module Manager (it can be accessed from the *Extensions* menu), Plugin Manager (you can also access it from the *Extensions* menu), Template Manager (it should also be accessed from the *Extensions* menu), and Mass Mail Manager (you can access it from the *Tools* menu).

This article will not present you any more details about Joomla! administration. The main thing to remember is that in order to administer a Joomla! site, no code or command line tools are required!

Joomla! Advantages

Now that you have successfully installed Joomla! and this article comes to an end, let me mention some other advantages:

It is 100% open source.
Its management is completely web-interface based.
Supports RSS and Atom newsfeeds.
Supports multiple languages.
It has banner advertisement management.
Supports accessibility options for the disabled.
Implements automatic full text search of site content.
Supports Extensions.
Supports Search Engine Optimization (SEO).

Figure 13: Joomla! Main Administration page (Control Panel)

Creating an article is as easy as clicking the New icon in the Article Manager toolbar!

There is a WYSIWYG Editor included with the Joomla! installation called TinyMCE.

Joomla! supports *scheduled* publishing and *unpublishing* of articles!

Joomla! templates can not only be applied to entire sites but to individual pages!

and many others!

Summary

As you can see by now, Joomla! is an extremely powerful CMS that supports Mac OS X and uses well known open source components such as PHP, MySQL and Apache.

Joomla!'s capabilities can be greatly expanded by using extensions and there is also a community that is willing to help new users learn Joomla! and solve their problems.

All you need to begin using Joomla! is a basic understanding of HTML and CSS and you are ready to go!

Web Links

Joomla! Site: http://www.joomla.org/

Download Joomla!: http://www.joomla.org/download.html

Joomla! Discussion Forums: http://forum.joomla.org/

Joomla! Extensions Directory: http://extensions.joomla.org/

Joomla! Translations: http://joomlacode.org/gf/project/jtranslation

Using Joomla!

There are many resources available that can teach you how to use Joomla! What follows is a list of resources that I found useful when I was learning Joomla!:

http://www.lynda.com/home/DisplayCourseNoTabs.aspx?lpk2=474 Joomla! 1.5 Essential Training from Lynda.com.

http://www.lynda.com/home/DisplayCourseNoTabs.aspx?lpk2=665 Joomla! Advanced CSS from Lynda.com.

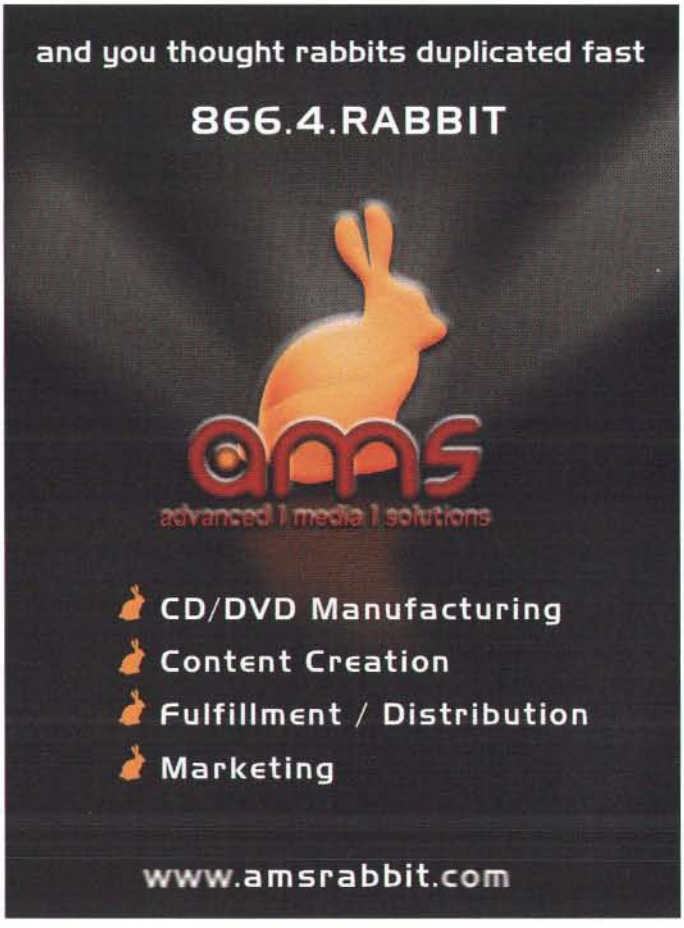
http://www.apress.com/book/view/1430216425 Beginning Joomla!, 2nd Edition

http://friendsofed.com/book.html?isbn=1430223758 Foundation Joomla!

http://oreilly.com/catalog/9780596804954/ Using Joomla!

About The Author

Mihalis Tsoukalos enjoys digital photography, writing articles and programming his iPhone 4 and iPad. He is the author of* Programming Dashboard Widgets, *an eBook. You can reach him at tsoukalos@sch.gr.



CORESEC: SECURITY TOPICS FOR ADMINISTRATORS AND PROGRAMMERS

It's Not Your Kid's Cell Phone Any More

iOS 4 is changing the portable device game with serious enterprise features.

By Michele (Mike) Hjörleifsson

Introduction

It has been three years and a few months since the first iPhone released to much acclaim and of course pundit criticism. If I had a nickel for every time I heard that the iPhone was not an enterprise mobile computing device, well, I could buy some iPad's. All joking aside, some of the initial criticisms and ongoing feature requests from for the iPhone OS through iOS 4.x have been warranted. But the fact of the matter is that not only did iPhone change the smart phone paradigm it also changed the enterprise mobile computing demand structure.

For many years, at larger organizations, you were issued your mobile phone or smart phone and had to abide by the policies laid out by your employer, leading to many two two-phone totting IT professionals and executives. Due to employee abuses, turnover, hard to decipher and constantly changing cell carrier policies, and fees, employers have withdrawn from the organizationally organizationally-issued smart phone in droves. Add to this the motley crue of professionals that went out and bought their own iPhone's and expected, then demanded, that IT support the devices in their organizations., the The model has shifted, and IT professionals have been forced to adapt. While remote wipe and other capabilities were provided in earlier iOS versions via ActiveSync, for organizations that don't use Microsoft Exchange, or did not want to license ActiveSync, there weren't a whole lot of options.

As a security focused individual, I too felt that the iPhone still needed some more enterprise focused security and data protection features., and iIn iOS 4.x, it Apple seems to have delivered on the majority of them. In this months segment we will explore three options for managing security and configuration profiles on iOS 4, starting with an enterprise enterprise-wide option that supports iOS as well as Windows Mobile, Symbian and of course, Blackberry.

Background

A little background is in order to familiarize you with the impact of two features hotly touted but not obvious contributors to the new security model. Push notification and multi-tasking have been discussed as excellent end user focused features to provide notification and identification of events, messages etc. Multi-tasking provides the iPhone, and soon the iPad, with the ability to run applications in the background like we do on our current desktops and laptops. Here enters the security implications for iOS 4:, utilizing push notification to send configuration queries and commands, and multi-tasking to run the new MDM (Mobile Device Management) framework software, vendors can now design management solutions to properly monitor and manage devices connecting to their corporate networks and messaging systems. Wow, that is a lot of verbiage to state the simple fact that now, with the help of some software, administrators can now monitor and manage iOS 4.x devices en masse.

That is a wonderful thing for administrators, but how about initially configuring devices, revoking lost or removed devices to prevent unauthorized access? Enter SCEP, the Simple Certificate Enrollment Protocol, a draft standard from IETF, . SCEP is the evolution of the enrollment protocol originally developed by VeriSign, Inc. for Cisco Systems. SCEP is a PKI (public key infrastructure) communication protocol used to request certificates from a certificate authority, but this protocol can also push a configuration profile digitally signed to ensure authenticity. What SCEP provides, when properly implemented, is a method for simple enrollment and deployment of mobile computing devices like the iOS devices in large numbers, rapidly and efficiently. Let's explore two off the shelf options to implement this type of management infrastructure and then the

components required to roll-your-own implementation if you are more of a build versus buy organization.

Two caveats on the products mentioned in this article. First, this is by no means an exhaustive list of options available to IT administrators, rather a sampling of two representative types that fall into the "classes" of enterprise wide options and Apple only environment options. Second, both software platforms mentioned are in constant development to meet the changing landscape and some of the features mentioned were in development when this article was written and should be available as you read this.

Enterprise Options

MobileIron, founded in 2007 was originated through discussions with potential clients about what their requirements for an enterprise management platform for mobile devices should contain. With an impressive array of clients and partners like AT&T, Vodaphone and Korea Telecom, MobileIron represents an enterprise focused mobile management platform. The platform currently supports iOS, Windows Mobile, Symbian, Blackberry and is planning Android support meeting my one of my prerequisite requirements for a true enterprise platform:, support for more than one mobile device manufacturer. In a web presentation and phone discussion with the folks at MobileIron I investigated the feature sets and security posture of their platform. Of note is that their platform runs on either a rack mountable appliance or as a VMWare virtual machine in an enterprise VMWare environment, . both Both platforms are run a hardened Linux operating system. The user interface is web based and quite intuitive providing administrators with the ability to manage devices from a browser on any device. The platform allows for immense scalability, with a create- once- and- re-use infrastructure that can collect real time application information, storage usage, roaming usage real time. Using the provided policy engine administrators can revoke access to enterprise networks and assets if a policy is violated. For instance, if a rogue IT user decides to jail brakebreak their iPhone, and that is a violation of your organization's policy for allowed devices, you can by policy automatically revoke access to your resources for that device until it is remediated. And tThis is where I feel the enterprise functionality really stands out in MobileIron's platform.

Let's look at a quick scenario; Bob the IT guy decides to jail brakebreak his phone over the weekend then comes into work and is notified by SMS or email (or both) that his phone violates policy and is no longer allowed to access the network. Bob then decides it is not worth giving up email access to have a couple of cool jail brakebreak features and restores his phone to standard iOS 4. Bob can then retry access and the system will recognize that his device has been remediated and allow him onto the network. This is an invaluable feature to current enterprise administrators, because as I mentioned earlier, many mobile devices on today's enterprise networks are actually owned by the user and as such, they can jail brakebreak the

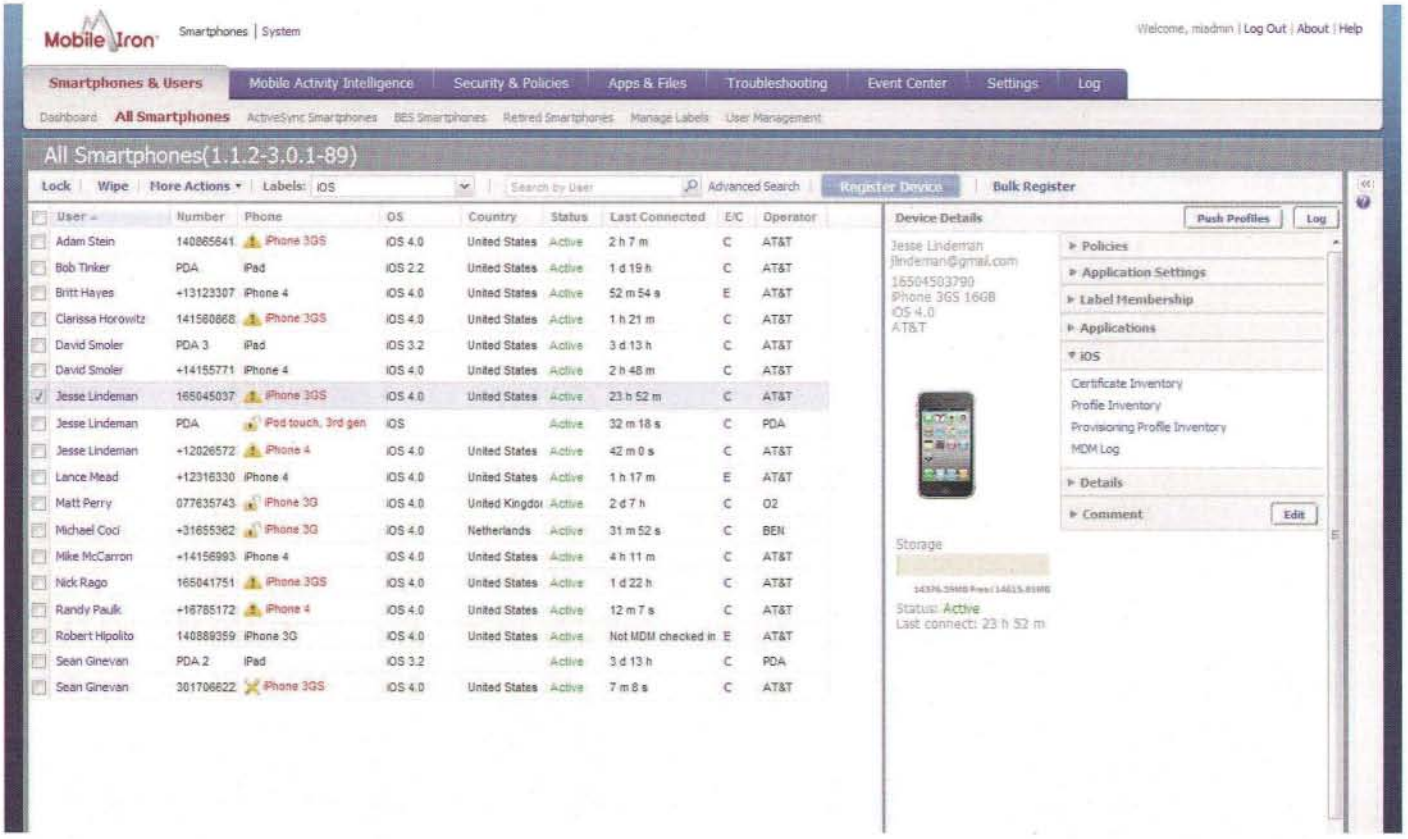


Figure 1 – MobileIron device view

phone if they want to, but that doesn't mean you have to let them on the network. Providing this type of flexibility is a necessity in larger enterprises.

In several of my previous articles I have mentioned 802.1x, a standard for controlling access to the wired or wireless network. MobileIron can provide client side certificate generation and 802.1x certificates as part of the enrollment process. This removes another step required by administrators configuring mobile devices in their environment. Though this may not sound grand in nature, if you have ever had to manually configure 100 or more mobile devices for email, network access, and VPN access manually, this feature shines.

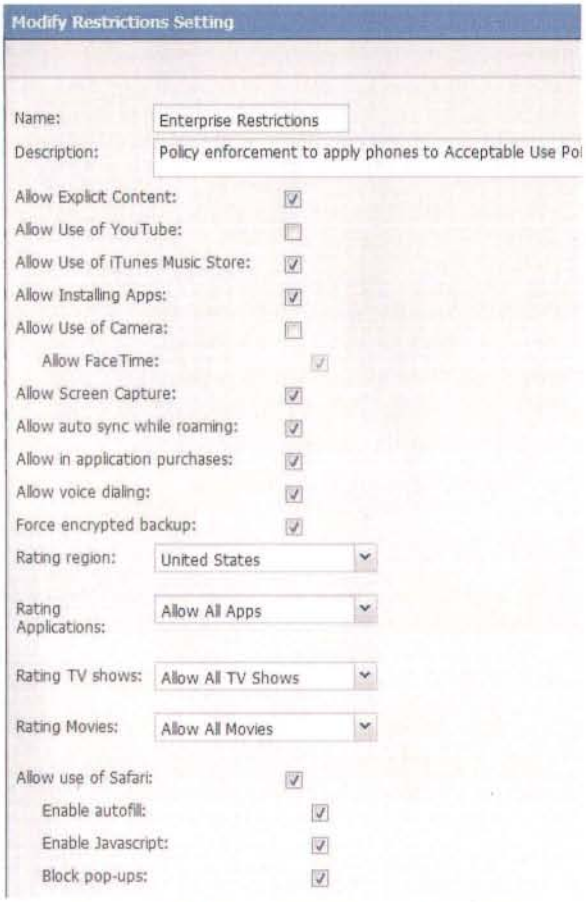


Figure 2 – MobileIron iOS restriction enforcement.

MobileIron also provides it's own certificate authority for those organizations that have not deployed their own, or, it can work with your existing certificate authority. Last, but certainly not least, MobileIron provides an API to allow custom development of rules, policies and actions. I posed the following scenario to MobileIron:

> *My corporate policy requires that phones do not leave a certain geographic area, otherwise they must be wiped to protect against privacy and other data leakage.*

Sounds like a daunting task for any IT administrator, but with MobileIron's API, an administrator could create a monitoring event that gathers longitude and latitude data from the mobile device and if the device leaves the geographic area send a wipe command to comply with the policy (only supported in iOS 4.); Pretty powerful and definitely enterprise class. The large list of pre-built policy templates and data gathering rules and reports will get an enterprise administrator running with relative ease. Using the feature set listed below as a benchmark for enterprise mobile device platforms, MobileIron stacked up quite nicely against other solutions.

Feature Set Requirement:

Fault Tolerance of Management Platform
No reliance on Exchange or ActiveSync
SCEP implementation for over the air enrollment
Simple re-joining of remediated devices
Real time reporting and monitoring
Flexible reporting
An application programming interface (API) to allow for custom extensions
Cross platform management user interface
Cross platform device support
Ability to restrict camera use
Inventory and Blacklist for device applications
802.1x and VPN configuration support
Passcode policy enforcement
Apple iPhone Configuration Utility profile support

An Enterprise Apple-Like Environment

While MobileIron and several other enterprise options are available, they typically aim at mixed environments of large numbers of users (100 or more for instance.). What if you have a smaller organization of, let's say, 65 employees all equipped with iPhone and/or iPad and want to be able to provide management tools to enforce policy and protect data? Enter Tarmac from the long time Apple developer Equinux. Tarmac runs on an Apple Xserve, or any Mac OS X client machine, integrates with your existing directory service like Open Directory, Active Directory, eDirectory or OpenLDAP, and provides integration with your existing certificate authority or a Microsoft certificate authority.

Figure 3 – TARMAC easing profile installation.

As you would expect from Equinux, Tarmac has an Apple application look and feel, supports all iOS versions, and supports all the MDM restrictions allowed by Apple such as disabling the camera. Though the reporting and notification notifications are not currently part of the platform, they are planned for a future release. Tarmac represents one of a handful of Apple Apple-centric, or Apple Apple-only management platforms for the iOS devices. and fFor organizations that fall in this category, it is wonderful to see that the small to medium size business market is being addressed.

Figure 4 – TARMAC management running on an iPad.

Do It Yourself

As an avid geek and tinkerer I always look for a way to create my own version or seek out an open .source version of a tool. Fortunately, Apple has provided a roadmap on how to setup your own iOS management infrastructure with several documents on http://www.apple.com/iphone/business/integration/ and even more on http://developer.apple.com. Utilizing these documents, along with your existing or new directory service, an enterprise certificate authority (like the open source EJBCA from http://primekey.se), the iPCU (iPhone Configuration Utility) and a web server you can create your own infrastructure from scratch. Unfortunately, you can't use the internal certificate authority Apple provides in Mac OS X to do SCEP, but EJBCA runs natively on Mac OS X, and scales immensely and provides for CRL (certificate revocation list) and OCSP (online certificate status protocol) functionality lacking in the certificate authority provided in OS X. It also scales up and out. For those choosing the DIY route, Prepare prepare to spend several hours digging through documentation on SCEP, and several more hours setting up and integrating the pieces; but it is not an insurmountable task. You can implement your own solution if you have the time and desire to do so. Based on your feedback to mikeh@mactech.com, I may even provide a detailed step by step how to if there is enough interest.

Conclusion

Depending on the size of your organization, the culture inside your organization (build vs buy) and your device requirements there are a growing number of options available to you as an administrator allowing you to manage your mobile device configurations and security profiles. With the strides made by Apple in iOS 4.x with MDM and the product offerings provided by companies like MobileIron, Equinux and several others, the naysayers about iPhone in the enterprise are being slowly continually muted.

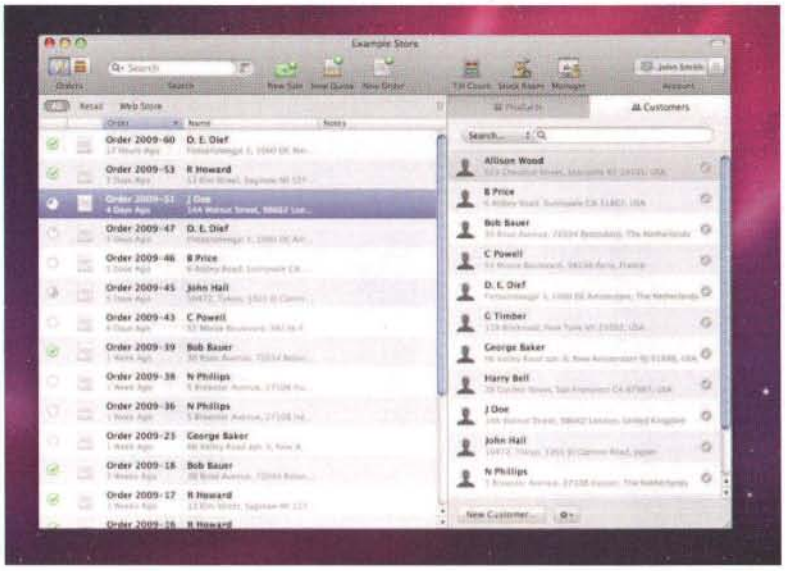
About The Author

Michele (Mike) Hjörleifsson, co-author of the Apple Training Series: Security and Mobility courseware has been developing on the Apple platforms since the Apple][+, implementing network and remote access security technologies since the early '90s, and worked with the nation's largest corporations and government institutions, authoring white-papers, technical magazine articles and topical discussions at IETF (Internet Engineering Task Force), and other organizations on security topics, and podcasting with Apple Podcast Producer. He is currently working with companies worldwide on Apple and Security consulting projects and conducting Apple IT and Pro Apps training. Feel free to contact him at mhjorleifsson@me.com

Checkout

A must-have point-of-sale application

by Dennis Sellers



Checkout

Checkout (http://checkoutapp.com/) is a point-of-sale app for the Mac that's a must-have for those who need web store integration. The software is designed to help retailers manage their point-of-sale processes, order entry, inventory management, customers and vendors.

Checkout was recently revved to version 3.0. The new version adds support for barcode label printing, a revamped Product Manager, and an overall speed boost. Version 3.0 also coincided with the launch of a new Checkout web store, Enstore.

Enstore is a pay-as-you-go web store that integrates with Checkout. Products can be managed in Checkout and then synced with Enstore. Online orders and customers are then tracked directly in Checkout.

Enstore comes with the flexibility to customize your store, automatic shipping and tax rate lookup (in the US and Canada), payment processing through major payment providers and a set of templates created by the designers behind Checkout.

Enstore, currently in beta, comes with no setup fee, free hosting, and unlimited bandwidth and storage. It's powered by Google App Engine.

Checkout 3 also has a new interface to set up product variations like sizes and colors. The number of definable product properties is practically limitless. Rebuilt from the ground up, the software's new product manager offers better search functions and allows for editing and deletion of multiple products at the same time.

You can add barcodes to items, then print them on Avery or Dymo labels. Checkout 3 also lets you accept down payments and deposits on orders.

With Checkout 3, you can connect up to 20 workstations to one store — but only when the store is hosted on an Intel-based Mac.

Checkout 3 also boasts: multi-region sales tax support; support for multiple suppliers per product; the ability to scan in or enter serial numbers for your products; the ability to edit properties of multiple products at once; support for manually configured connections in the Login window; and support for shipping addresses and shipping cost on orders.

Every document in Checkout offers access to a History and Notes interface. You can view a complete list of changes to the document, when they were made and by whom. You can add notes for yourself and your coworkers for later referral. The contents of your notes can be used to search through all documents.

You can, of course, record cash, credit card and other payments. Checkout calculates due change and prints complete product, payment and sales tax details on your customer receipts.

Checkout 3 also plays well with others. If you already have a customer database, the software imports customer records from TSV, CSV and vCard files. Whether your contacts are stored in FileMaker, Address Book, Entourage or an Excel file, you can take them with you. Products can be imported from CSV and TSV files.

Checkout also integrates with both AccountEdge and Intuit QuickBooks. It supports current US and Canadian versions of AccountEdge. Note that it only supports current US Quickbooks versions. Other versions might not be compatible.

Additionally, Acclivity, exclusive distributors of MYOB software in the US, and Sofa, developers of Mac point of sale software Checkout, have created Werck BV, a joint venture. Werck will develop, market and support Checkout for Mac small businesses around the world.

Acclivity, which does business as MYOB US (http://www.myob-us.com), will distribute Checkout in the US and Canada under the MYOB brand, while Checkout will be sold under the newly formed Werck brand in all other international markets. Pricing starts at US$399.

MailPlane
Making GMail Mac-friendly

If you use GMail, you'll certainly find Mailplane from Uncomplex GMBH useful. It puts a wrapper around GMail's web interface, but keeps it in a separate application. There are times that it will serve you better than some of the email clients like Mail or Outlook.

If you've used Apple Mail and Gmail, you probably notice that web-browser-based email (like the latter) simply doesn't work the same as the standard email apps (the former) that most folks are accustomed to using. For example, you can't just drag a document to an icon in the Dock to attach it to a new message. Also, Gmail lets you use either POP or IMAP to access your mail using an e-mail client such as Apple Mail, but Gmail's approach to message organization doesn't always play nice with Mail (or other) e-mail clients.

Enter MailPlane, which uses WebKit to provide a native Gmail interface in a standalone program. (WebKit is an open source web browser engine. It's also the name of the Mac OS X system framework version of the engine that's used by Safari, Dashboard, Mail, and many other Mac OS X applications to render web content).

Acting as a site-specific web browser for Google's Gmail, Mailplane is a full-fledged Mail client for the Desktop. It integrates the Gmail web interface into the Mac experience. It supports multiple Gmail and Google Apps accounts and lets you switch between accounts without the need to sign in/sign out from the Gmail accounts.

MailPlane is also very Mac friendly. With iLife integration, you can browse and attach files from your iPhoto and iTunes libraries. Downloads can be directly imported into iPhoto, as well. The integrated screenshot tool lets you take and attach a window, screen or region. What's more, you can link Gmail conversations with Mac documents. You can drag and drop files and images on the dock application icon, or any Mailplane window to create and upload attachments. With automatic photo optimization, image attachments can be converted and resized to make the message even smaller.

Mailplane can play a user defined sound, as well as show the number of unread messages in the application icon, account drawer and status menu item. As Mailplane monitors all Gmail accounts, unread message counters and message subjects are displayed for each account.

You can personalize your messages with formatted signatures. You can even make MailPlane your default email client if you wish.

Recently, Mailplane was updated. The upgrade sees the return of Spanish and Chinese translations and updated Simplified and Traditional Chinese translations. With MailPlane, Gmail continues to work much as it does in a web browser, but MailPlane provides a toolbar that looks more like that of a traditional e-mail client. For example, it sports buttons for Refresh, New, Reply, Forward, and more. The toolbar is also customizable so you can tweak it to fit your preferences.

You can set up multiple Gmail accounts in Mailplane. To do so, choose one in the Accounts drawer and click on Switch To, and Mailplane logs you out of your current account and into the new one. However, you can't be logged into two accounts simultaneously.

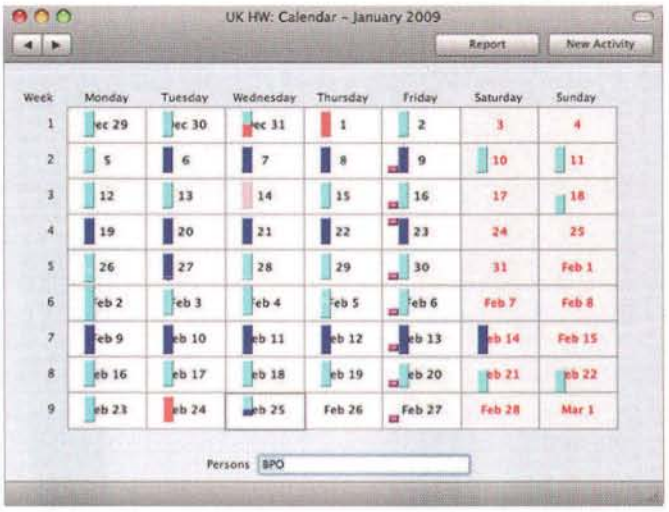
Another nice touch is the Screenshot button. Click it and it opens the Mac OS X app, Grab, and lets you take a snapshot of an area of Mac's screen that you determine. The screen grab is immediately attached to an email.

Mailplane is a Universal Binary so it runs natively on both PPC and Intel Macs. It requires Mac OS X 10.4.11 or higher. A demo is available at the Uncomplex web site (http://mailplaneapp.com/download/).

A single user license costs US$24.95 and may be used by a single person on two Macs. A family option (five users in same household) is $8. Educational discounts are available.

Hansaworld Enterprise

Flexible, multi-platform business solutions



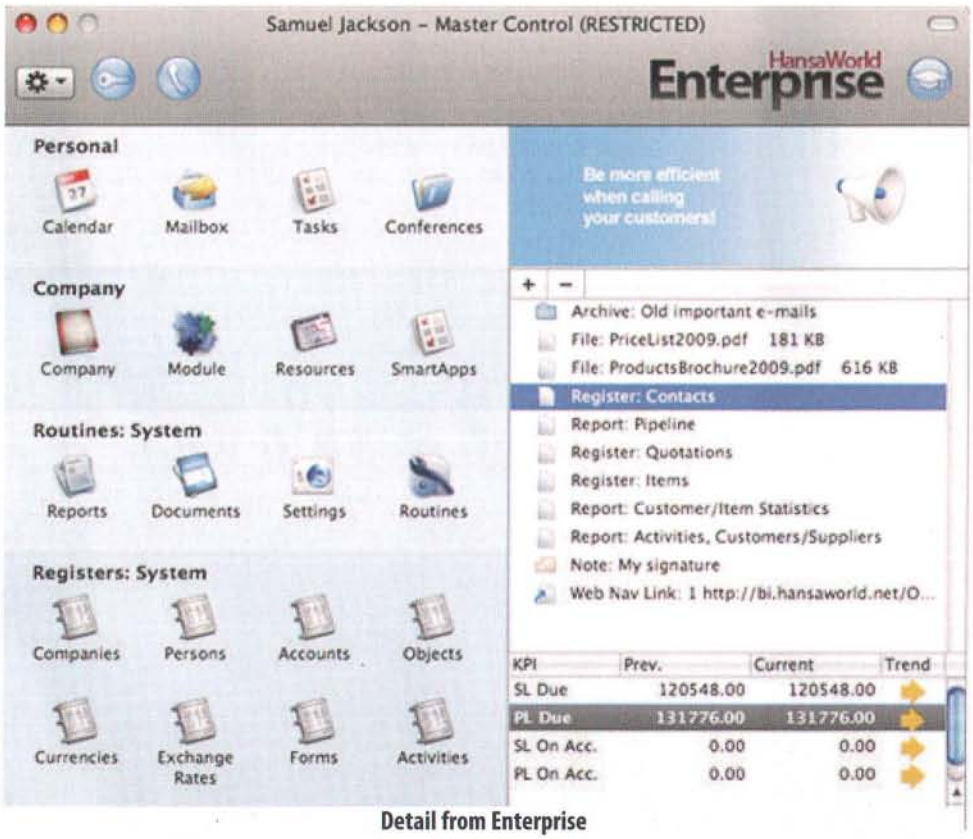
Detail from Enterprise

Hansaworld Enterprise (http://www.hansaworld.com/global?lc=EN&cc=global) is an Integrated Business Management (IBP) that runs on the Mac, as well as Windows and Linux systems. It supports multiple currencies and consolidation of data from different companies.

Hansaworld Enterprise is designed to be flexible. You can mix and match different operating systems in your implementation. The server can be run on various configurations of the aforementioned operating systems, and users can log in via clients on Mac OS X, Windows, Linux, web browsers and a range of mobile devices.

You can even run Enterprise from multiple locations without terminal emulation or other third-party solutions. This is pretty important if you want real-time management reporting across a variety of shops, offices or companies.

Hansaworld Enterprise offers logistics and stock, plus a large selection of vertical solutions, in addition to Enterprise Resource Planning (ERP) & Customer Relationship Management (CRM). It supports MS SQL, IBM's DB2 or Oracle databases and includes a web shop and corporate portal.



Detail from Enterprise

At its core, the Enterprise ERP system offers the typical Enterprise Resource Planning (ERP) modules of accounts, order processing, stock, manufacturing and job costing. By offering a range of Customer Relationship Management (CRM) modules — such as email, document management, graphical calendars and schedulers, and a bulletin board, all in the same application — the system is able to offer interaction between its component elements.

Enterprise ERP software system also provides a series of modules designed for specific industries, which means you can expand it to fit your needs. In addition to ERP & CRM, ERP system Enterprise offers logistics and stock, mobile and WAN access, plus a large selection of vertical solutions.

You can use HansaWorld Enterprise's integrated workflow to trigger additional working steps such as follow-ups, authorizations or automated SMSs, on-screen messages or emails and more.

You can enter transactions in any currency you like. Hansaworld Enterprise supports not only multi-currency but also dual base currency. The difference between the two is that with a dual based system, each transaction is stored in two different base currencies with the correct exchange rate at the date of the transaction. This allows companies to report on transactions without revaluing the transactions in the secondary currency

With Hansaworld Enterprise, you can mark each line of every transaction with up to 15 levels of analysis. This lets you measure the turnover and profitability of the different facets of your business.

Enterprise has a real-time web engine that allows you to create web sites and quickly make changes to the content. There are templates for text and picture-based web sites and web shops, supporting customer-specific views of the website, flexible item groups, and even multiple languages. Other external parties can be given web browser access to any part of the system.

HansaWorld will customize Enterprise to your specific requirements using Hansa Applications Language (HAL). The changes are made directly in the application instead of using a toolkit to link a separate application.

TrueShip ReadyShipper

One-stop shipping client for businesses

The ReadyShipper software from TrueShip (http://www.trueship.com) for the Mac is FedEx/UPS shipping software. It offers integrated shipping for ecommerce, order management and accounting systems.

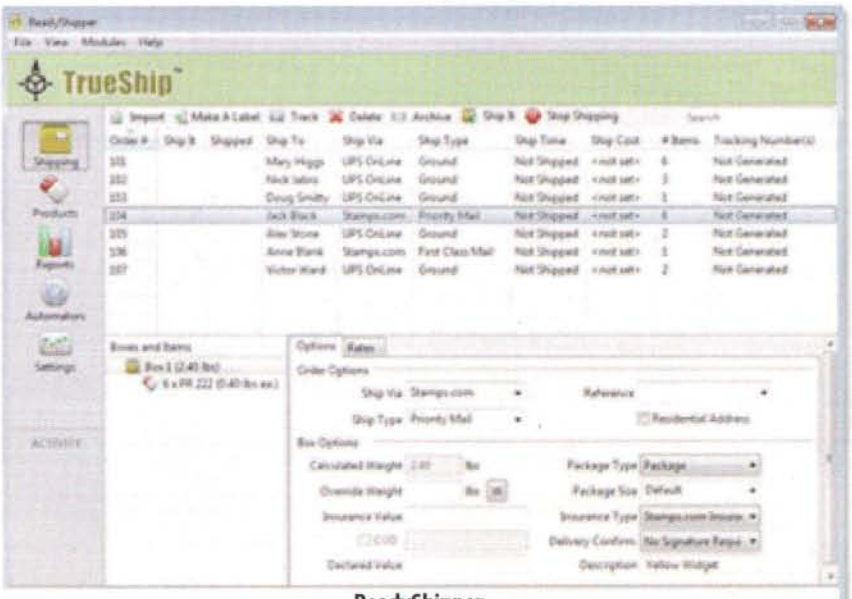
ReadyShipper is a client-based solution designed for importing, organizing and shipping orders. Its design and workflow expedites the shipping process and eliminates errors associated with manually sorting shipping documents and re-keying address information.

It features a native Mac interface that lets you create labels, make packing lists and email tracking confirmations, as well as use the Order Inspector and access the batch shipping capabilities. ReadyShipper comes pre-integrated with your choice of FedEx or UPS. You can import and ship your orders individually or in batch.

ReadyShipper supports international shipping and documentation through just about every supported shipping method. It features USB scale support for the Mac and PC. A universal USB scale driver is installed with ReadyShipper for use with a Stamps.com scale and many other scales supporting this universal driver. Drop your package on the scale, and the weight will be automatically entered into ReadyShipper.

You can see a full breakdown of the costs and services offered by UPS or FedEx and USPS featuring Stamps.com with ReadyShipper. What's more, you can eyeball a comprehensive table that displays all available methods and costs on a per-carrier basis.

ReadyShipper allows you to make custom exports for sales, accounting, vendors, customers or any application that will accept a CSV file. The Export Tracking CSV feature gives you the tools to add the information, title and columns to arrange a new report for CSV export. Each report can have its own unique name, and there's no limit to how many reports you can make.



ReadyShipper

ReadyShipper's database stores completed shipments for future reference. You can use it to review or track your shipments or create shipment export files in CSV or XML formats. To speed things up, it comes with an "Automator" that automates such actions as email notifications, ship-type converting, batch updating, address validation and more.

ReadyShipper's Make-A-Label feature lets you create your own shipping label or packing list on demand. It sports an address book to add your shipped addresses and your products.

If you do a lot of overnight shipping, you'll be pleased to know that ReadyShipper fully supports dimensional shipping to save you money on many types of overnight or USPS shipments. You can add package dimensions as you go or use ReadyShipper's auto-fill feature to complete box dimensions for commonly sized packages.

You can set the software to automatically send a confirmation email, complete with tracking number, with every shipment. You can add your customer service message along with your logos and graphics.

Ten days of support is included with a ReadyShipper subscription. The software installs on a Mac or PC system and uses the Internet to verify addresses, create shipping labels, and communicate with your shopping cart.

Plus, it's expandable. TrueShip offers a catalog of modules to customize and tweak the software as you wish. Several of the modules are free.

ReadyShipper includes an assistant designed to identify common shipping mistakes before they happen and a database for high-capacity shipping. It's offered as a subscription-based solution starting at US$19.95 a month; however, you can give it a try for free.

MT

About The Author

Dennis Sellers is a long time journalist. He started in the newspaper business, but has been in the online journalism business for the past 15 years. He's the editor/publisher of Macsimum News (http://www.macsimumnews.com)

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Advertiser/Product Index

Ad Index by Company for: MacTech Mag 26.09 (September/2010)

Absolute Software 25
AMS Rabbit 69
Appriver 35
AudioEngine 55
Benchmark Email 47
Brad Sniderman 78
Clickfree 31
Cognito 9
Da-Lite Screen Company, Inc. 56
EazyDraw (Dekorra Optics, LLC) 12
EMC Retrospect ..... BC
Ergonis Software GmbH 43
eSellerate/MindVision ..... IFC
FastSpring 42
Gefen Inc. 36
GroupSmarts, LLC 16
Hansaworld 11
HostGator 21
Houdah Software s. à r. l. 34
IGC, Inc. / MaxEMail.com 24
JAMF Software LLC 1
Just Mobile Ltd 57
KAE Corporation 75
LC Technology International, Inc. 33
Mac Rentals, Inc. 29
MacResource Computers & Service 18
MacTech Conference 4
MacTech Domains 52
MacTech Magazine 59
MacTech Magazine 27
Mark/Space Inc. 13
Mindraven 22
/n software inc. 41
Nuance Communications 45
Paradigma Software 48
Parallels Inc. 2-3
Quark Inc. 19
REAL Software, Inc. 15
RichardSolo 37
Sennheiser Electronic Corporation 49
Small Dog Electronics ..... IBC
Small Tree Communications 10
SmileOnMyMac, LLC 17
Smith Micro Software, Inc. 53
SoftPress Systems, Ltd. 63
Sonnet Technologies, Inc. 58
Teton Sports 16
TrueShip 14
Utilities4Less.com 73
VisiStat, Inc. 23
WebIS 30
ZAGG Inc 44

Ad Index by Product for: MacTech Mag 26.09 (September/2010)

Accessories • Sonnet Technologies, Inc. 58
AudioEngine • AudioEngine 55
Benchmark Email • Benchmark Email 47
Business Management Software • Hansaworld 11
Camping Equipment • Teton Sports 16
Casper • JAMF Software LLC 1
CD/DVD Replication • AMS Rabbit 69
Clickfree • Clickfree 31
Da-Lite Screen • Da-Lite Screen Company, Inc. 56
Domain Registration • MacTech Domains 52
EazyDraw • EazyDraw (Dekorra Optics, LLC) 12
Ergonis Utilities • Ergonis Software GmbH 43
eSellerate • eSellerate ..... IFC
Exchange Hosting • Appriver 35
FastSpring • FastSpring 42
Freeway • SoftPress Systems, Ltd. 63
Gefen • Gefen Inc. 36
GraniteSTOR • Small Tree Communications 10
Hosting • HostGator 21
HoudahGeo • Houdah Software s. à r. l. 34
IP*Works • /n software inc. 41
iPhone Accessories • RichardSolo 37
iPhone Apps • WebIS 30
Law Offices • Brad Sniderman 78
Long Distance Phone Service • Utilities4Less.com 73
MacResource Computers • MacResource Computers & Service 18
MacSpeech Dictate • Nuance Communications 45
MacTech Conference • MacTech Conference 4
MacTech DVD • MacTech Magazine 27
MacTech Magazine • MacTech Magazine 59
maxemail.com • IGC, Inc. / MaxEMail.com 24
MemoryMiner • GroupSmarts, LLC 16
Missing Sync • Mark/Space Inc. 13
MoneyWorks • Cognito 9
Parallels Desktop and Server • Parallels Inc. 2-3
PHOTORECOVERY®/FILERECOVERY® • LC Technology International, Inc. 33
Quark XPress • Quark Inc. 19
Rack Mounts • KAE Corporation 75
REALbasic • REAL Software, Inc. 15
Rentals, Computer • Mac Rentals, Inc. 29
Retrospect • EMC Retrospect ..... BC
SendStuffNow • Smith Micro Software, Inc. 53
Sennheiser Headphones • Sennheiser Electronic Corporation 49
SmallDog.com • Small Dog Electronics ..... IBC
TextExpander • SmileOnMyMac, LLC 17
Track, Manage & Protect • Absolute Software 25
TrueShip Shipping System • TrueShip 14
UBB.threads • Mindraven 22
Valentina • Paradigma Software 48
VisiStat • VisiStat, Inc. 23
Xtand • Just Mobile Ltd 57
Zagg Skins • ZAGG Inc 44

THE MACTECH SPOTLIGHT

Philippe Casgrain

TransGaming, Inc.

http://www.transgaming.com/

What do you do?

Software Developer

How long have you been doing what you do?

I've been developing software, mostly on the Mac, since 1991. Since 2009, I have been working at TransGaming, Inc., helping a team of really smart people create a Mac and Linux portability engine for Windows games.

What was your first computer?

A Commodore 64 and a subscription to Compute! magazine. I would spend hours typing in BASIC (and later assembly) programs.

Are you Mac-only, or a multi-platform person?

Multi-platform. As a university contractor, some of my simulation software would run for weeks on PowerMacs, so we got time on the big-iron Unix computers and ran the calculations in a matter of hours on 30 machines, at night.

Painter is Mac and Windows from the same source code, so that was my introduction to Windows programming.

And of course TransGaming is Mac and Linux as an end-user product, but you have to know your way around Windows from a programming perspective in order to fully virtualize the Windows API, feature-for-feature and bug-for-bug.

What attracts you to working on the Mac?

Initially, it was simply the fact that it was different, and it seemed to work so much better than the other systems.

Since then, the combination of Terminal.app and the wonderful GUI makes me happy on a daily basis, as it appeals equally to the left side and the right side of my brain.

What is the advice you'd give to someone trying to get into this line of work today?

Create some software, experiment, scratch an itch, and release something, hopefully Open Source on a social site like BitBucket or Github, but it could be an app on the App Store. That will get your name out there, and before you know it people will start recognizing you and say things like "yeah, I follow your blog / twitter / tumblr!"

In fact, developing something for a mobile device has some big advantages as opposed to a desktop. The mobile platform is so limited that you have to make some choices early on, and you can get to the end a lot faster. Plus, you get to carry your app with you and show it to others whenever you meet them; that is so much better than a business card!

What's the coolest tech thing you've done using OS X?

I once tied together 30 PowerMacs in a lab to run chunks of calculations, in parallel, for a large simulation project. Very SETI@Home, but all my own code. This was before Xgrid, which makes this kind of application trivial.

Ever?

I worked on a little-known project called Sketch Pad. It was a subset of Corel Painter, and was designed for a full-screen environment (especially the Wacom Cintiq monitor/tablet). It is instant-on, remembers where you are, all your drawings (like a real sketch pad), has no "Save" (only "Export") and the semi-transparent, rounded tools palettes faded out of sight when you started painting. It is very iPad-like in its design, but was released a few years ago. I say "little-known" because even though it is an awesome product, it never got any marketing. Talk about a missed opportunity...

Where can we see a sample of your work?

The last four versions of Painter (8-11) and the aforementioned Sketch Pad, which I'm particularly fond of.

I also had a hand in the Mac versions of DragonAge, Settlers 7 and Toy Story 3, amongst others

I infrequently post to my blog, http://developer.casgrain.com, and my open source projects are hosted on http://github.com/philippec and http://bitbucket.org/philippec

The next way I'm going to impact IT/OS X/the Mac universe is:

I will help bring high-performance, high-impact games to the Mac, of course!

Anything else we should know?

I'm the co-host of a bi-weekly Cocoa podcast with my friend Philippe Guitard, where we discuss development news and spotlight libraries, frameworks and tools to help you build your applications better, faster and cheaper. We've been at it since February 2009. Have a listen at http://www.cocoaminded.com/.

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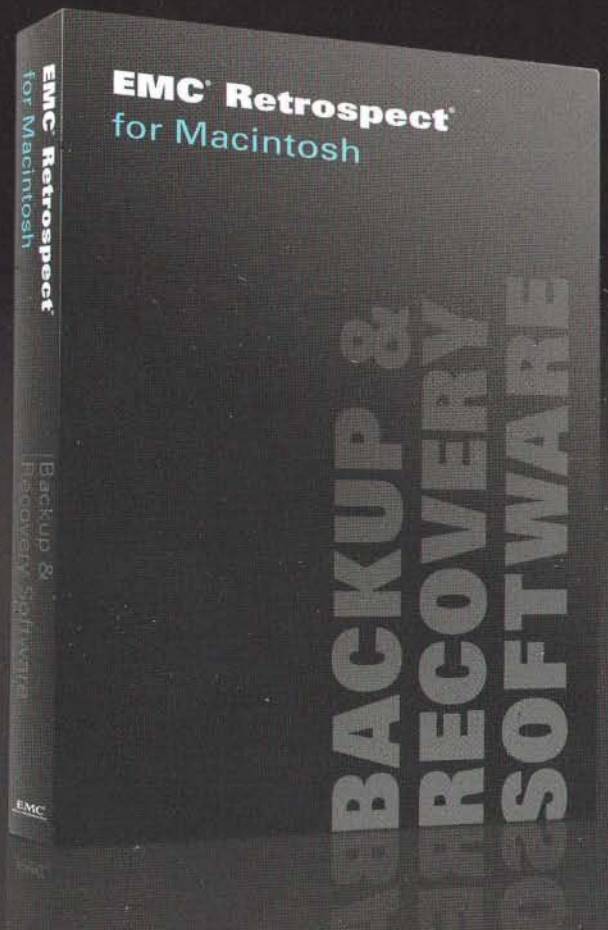

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